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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

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SEBU7763-03
July 2009

Operation and Maintenance Manual

D8T Track-Type Tractor

J8B1-Up (Machine)
KPZ1-Up (Machine)

i02877581

Maintenance Interval Schedule

SMCS Code: 7000

Ensure that all safety information, warnings, and instructions are read and understood before any operation or any maintenance procedures are performed.

The user is responsible for the performance of maintenance, including all adjustments, the use of proper lubricants, fluids, filters, and the replacement of components due to normal wear and aging. Failure to adhere to proper maintenance intervals and procedures may result in diminished performance of the product and/or accelerated wear of components.

Use mileage, fuel consumption, service hours, or calendar time, WHICH EVER OCCURS FIRST, in order to determine the maintenance intervals. Products that operate in severe operating conditions may require more frequent maintenance.

Note: Before each consecutive interval is performed, all maintenance from the previous interval must be performed.

When Required

Battery, Battery Cable or Battery Disconnect Switch - Replace 133
Bottom Guard (Power) - Clean 134
Cooler Cores and A/C Condenser - Clean 138
Cutting Edges and End Bits - Inspect/Replace ... 148
Engine Air Filter Primary and/or Secondary Element - Clean/Replace 149
Engine Air Precleaner - Clean 151
Equalizer Bar Center Pin - Measure 160
Equalizer Bar End Pins - Measure 161
Ether Starting Aid Cylinder - Replace 161
Front Idler Position - Check 166
Fuel System - Prime 168
Fuses and Circuit Breakers - Replace/Reset 173
High Intensity Discharge Lamp (HID) - Replace .. 174
Hydraulic System Filter Screens - Clean 175
Oil Filter - Inspect 182
Power Train Scavenge Screen - Clean 185
Radiator Pressure Cap - Clean/Replace 190
Ripper Tip and Shank Protector - Inspect/ Replace 192
Torque Converter Scavenge Screen - Clean 195
Winch Wire Rope - Install 201
Window Washer Reservoir - Fill 201
Window Wipers - Inspect/Replace 202
Windows - Clean 202

Every 10 Service Hours or Daily

Backup Alarm - Test 132
Braking System - Test 135
Cab Filter (Fresh Air) - Clean/Inspect/Replace ... 136
Cooling System Coolant Level - Check 146
Engine Oil Level - Check 154
Fuel System Primary Filter (Water Separator) - Drain 170
Fuel Tank Water and Sediment - Drain 173
Horn - Test 175
Hydraulic System Oil Level - Check 180
Indicators and Gauges - Test 181
Pivot Shaft Oil Level - Check 183
Power Train System Oil Level - Check 188
Seat Belt - Inspect 193
Walk-Around Inspection 199

Every 50 Service Hours

Bulldozer Tilt Brace and Tilt Cylinders - Lubricate 135
Cab Filter (Recirculation) - Clean/Inspect/ Replace 137
Lift Cylinder Yoke Bearings - Lubricate 182
Ripper Linkage and Cylinder Bearings - Lubricate 192
Track Pins - Inspect 197

Every 250 Service Hours

Belt - Inspect/Adjust/Replace 133
Engine Oil Sample - Obtain 155
Engine Oil and Filter - Change 156
Equalizer Bar End Pins Oil Level - Check 160
Final Drive Oil Level - Check 163
Track - Check/Adjust 195
Winch Fairlead Rollers - Lubricate 199
Winch Oil Level - Check 199

Initial 500 Hours (for New Systems, Refilled Systems, and Converted Systems)

Cooling System Coolant Sample (Level 2) - Obtain 142
Electronic Unit Injector - Inspect/Adjust 149
Engine Valve Lash - Check/Adjust 159
Engine Valve Rotators - Inspect 159
Winch Oil and Breather - Change/Clean 200

Every 500 Service Hours

Engine Crankcase Breather - Clean 151
Engine Oil and Filter - Change 156
Final Drive Oil Sample - Obtain 163
Fuel System Primary Filter - Clean/Replace 169
Fuel System Secondary Filter - Replace 171
Fuel Tank Cap Filter and Strainer - Replace/Clean 172
Hydraulic System Oil Filters - Replace 179
Hydraulic System Oil Sample - Obtain 181
Power Train Breather - Clean 184
Power Train Oil Filters - Replace 184
Power Train System Oil Sample - Obtain 189
Recoil Spring Compartment Oil Level - Check ... 191
Steering Charge Filter - Replace 194

Every 1000 Service Hours or 6 Months

Battery - Inspect 132
Power Train System Oil And Screens - Change/Clean 186
Rollover Protective Structure (ROPS) - Inspect .. 193
Winch Oil and Breather - Change/Clean 200

Every 2000 Service Hours or 1 Year

Engine Mounts and Equalizer Bar - Inspect 152
Final Drive Oil - Change 162
Final Drive Seal Guard Packing - Replace 164
Hydraulic System Oil - Change 176
Hydraulic System Oil Filter (Pilot) - Replace 178
Radiator Guard Pin Joint - Inspect 190
Track Roller Frame - Inspect 198
Track Roller Frame Guides - Inspect 198

Every Year

Cooling System Coolant Sample (Level 2) - Obtain 142
Engine Air Filter Primary and/or Secondary Element - Clean/Replace 149
Refrigerant Dryer - Replace 192

Every 3 Years After Date of Installation or Every 5 Years After Date of Manufacture

Seat Belt - Replace 194

Every 4000 Service Hours

Electronic Unit Injector - Inspect/Adjust 149
Engine Valve Lash - Check/Adjust 159
Engine Valve Rotators - Inspect 159

Every 6000 Service Hours or 3 Years

Cooling System Coolant Extender (ELC) - Add .. 145
Cooling System Water Temperature Regulator - Replace 148

Every 12 000 Service Hours or 6 Years

Cooling System Coolant (ELC) - Change 143

i01957816

Backup Alarm - Test

SMCS Code: 7406-081

In order to test the alarm for proper functioning, turn the engine start switch to the ON position.

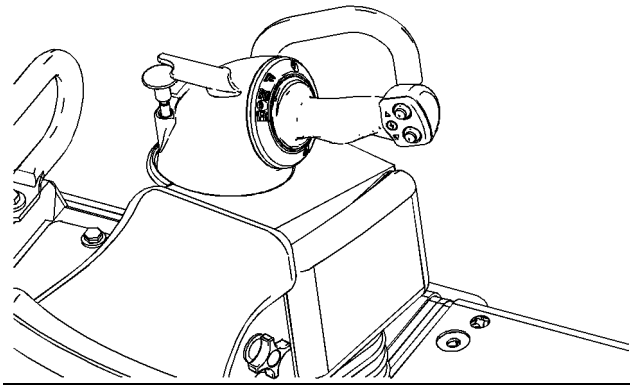


Illustration 187 g01017699

Apply the service brake. Release the parking brake. Move the transmission direction selector to the REVERSE position.

The backup alarm should start to sound immediately. The backup alarm will continue to sound until the transmission gear selector is moved to the NEUTRAL position or to the FORWARD position.

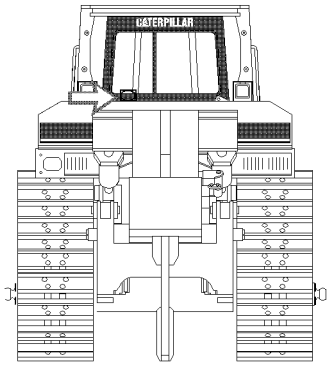


Illustration 188 g01017684

The backup alarm is on the rear of the machine.

The nonadjustable backup alarm is set at the appropriate sound level when the machine is shipped from the factory.

i03613865

Battery - Inspect

SMCS Code: 1401-040

Battery Inspect

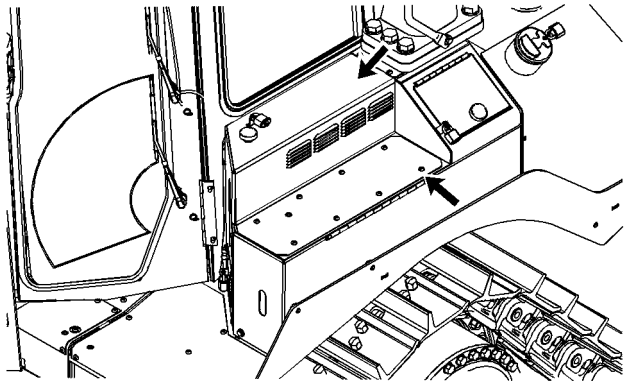


Illustration 189 g01117295

1. Open the battery access covers. The battery access covers are located on the left side of the machine outside the operator compartment.

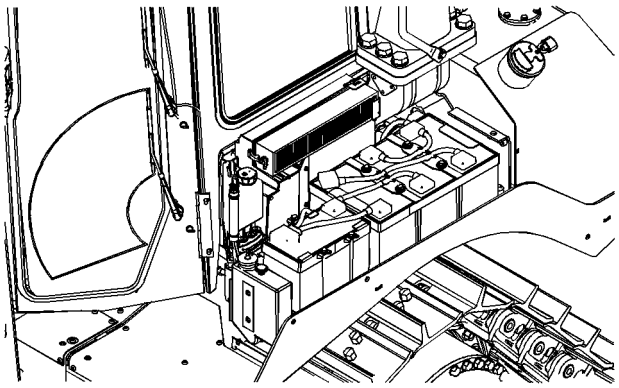


Illustration 190 g01117315

2. Tighten the battery retainers. Clean the top of the batteries with a clean cloth. Keep the terminals clean and coated with petroleum jelly. Install the terminal covers after you coat the terminals.

3. Close the battery access covers.

i02019456

Battery, Battery Cable or Battery Disconnect Switch - Replace

SMCS Code: 1401-510; 1402-510; 1411-510

1. Turn the engine start switch key to the OFF position. Turn all of the switches to the OFF position.
2. Turn the battery disconnect switch to the OFF position. Remove the key.
3. Disconnect the battery cable at the battery disconnect switch. The battery disconnect switch is inside the left engine access door.
4. Disconnect the negative battery cable at the battery.
5. Replace the disconnect switch, the battery cables, or the batteries, as required.
6. Connect the negative battery cable at the battery.
7. Connect the negative battery cable at the battery disconnect switch.
8. Install the key and turn the battery disconnect switch to the ON position.

Battery Recycle

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i02229215

Belt - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510

Your engine is equipped with a serpentine belt that drives the alternator and the air conditioner compressor, if equipped.

This engine is equipped with a belt tightener that automatically adjusts the belt to the correct tension.

Inspect

1. Park the machine on level ground. Lower the dozer blade to the ground. Move the transmission control to the NEUTRAL position and engage the parking brake. Shut off the engine.
2. Turn the battery disconnect switch to the OFF position.
3. Open the engine access doors on the right side.

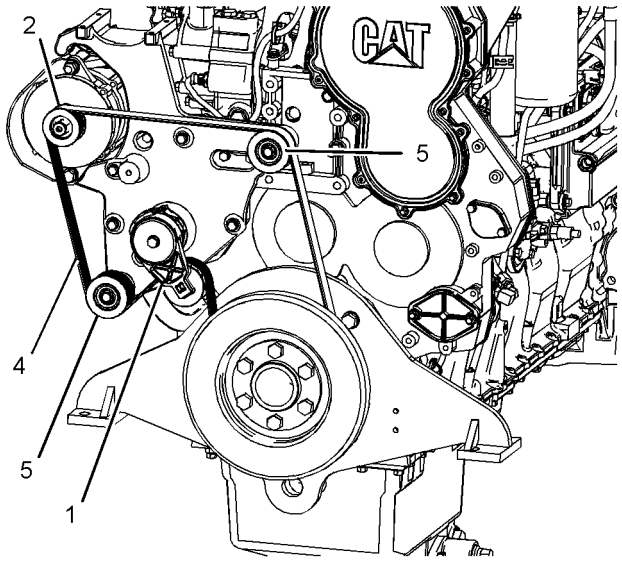


Illustration 191 g01117063

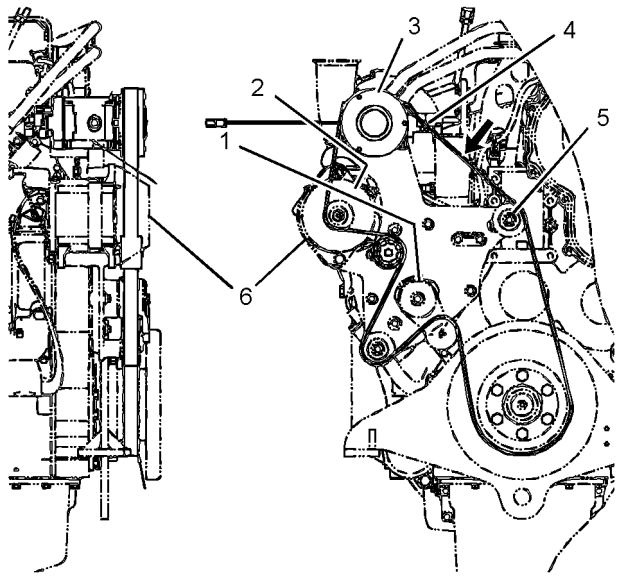


Illustration 192 g01017579

Front and left side view

(1) Belt tensioner
(2) Alternator (reference only)
(3) Air conditioner compressor (reference only)
(4) Serpentine belt
(5) Idler pulley (reference only)
(6) Alternator guard (reference only)

4. Inspect the condition of serpentine belt (4). Replace the serpentine belt if excessive wear or cracking has occurred. Wear due to belt slippage indicates that the belt tensioner possibly needs to be replaced.

5. Close the engine access doors.

6. Turn the battery disconnect switch to the ON position.

Replace

1. Park the machine on level ground. Lower the dozer blade to the ground. Move the transmission control to the NEUTRAL position and engage the parking brake. Shut off the engine.

2. Turn the battery disconnect switch to the OFF position.

3. Open the engine access doors.

4. Turn belt tensioner (1) in order to release the tension from the belt with a square drive.

5. Remove the belt.

6. Install the new belt.

7. Close the engine access doors.

8. Turn the battery disconnect switch to the ON position.

i02248240

Bottom Guard (Power) - Clean

SMCS Code: 7153-070

NOTICE
Do not operate the machine with the guard in the lowered position. Damage to the machine or actuator could result.

⚠ WARNING

The guard is heavy. Personal injury or death may result from being struck by or trapped under the guard. Do not allow anyone to work near or under the machine when the guard is being raised or lowered.

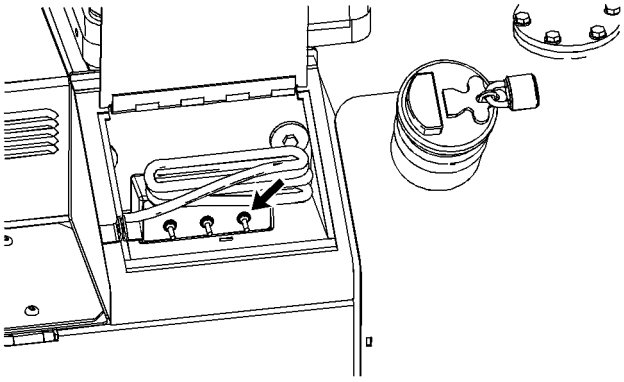


Illustration 193 g01131971

The power guard control is located in a compartment on the left fender in front of the fuel tank.

The power guard control opens the bottom guards for easier access during cleaning.

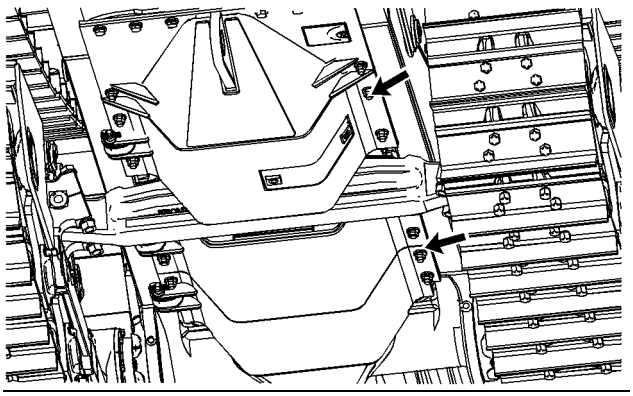


Illustration 194 g01131976

NOTICE
Do not activate switches for power guard control without removing the bolts from the guard. Damage to the actuator could result.

1. Position a jack under the bottom guard in order to lower the guard. The head of the jack should not be touching the guard.
2. Remove the bolts from the bottom guard and move switch (1) downward in order to lower the guard.

   If the guard lowers completely onto the jack, it is possible that the actuator has failed. Use the jack to support the guard and lower the guard to the ground.
3. If the guard remains supported above the jack, remove the jack.
4. Lower the guard to the lowest position.
5. Remove all foreign debris from the underside of the engine compartment.
6. Move the switch upward in order to raise the guard.
7. Position the jack under the guard prior to replacing the bolts. The head of the jack should not be touching the guard.
8. Install the bolts.

i01958206

Braking System - Test

SMCS Code: 4100-081; 4267-081

⚠ WARNING

If the machine moves during the test, reduce the engine speed immediately, and engage the parking brake.

If the machine moved while testing the brakes, consult your Caterpillar dealer for brake inspection and repair. Damaged brakes must be repaired before returning the machine to operation.

Note: The machine can drive through the brakes in first gear.

Make sure that the area around the machine is clear of personnel and clear of obstacles.

Test the brakes on a dry, level surface.

Fasten the seat belt before you test the brakes.

1. Start the engine.
2. Raise all attachments.

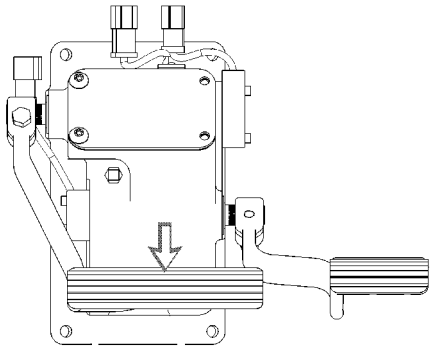


Illustration 195 g01017767

3. Depress the brake pedal.
4. Release the parking brake.
5. While the brake pedal is depressed, move the directional control to the SECOND SPEED FORWARD position.
6. Gradually increase the engine speed to full load speed. The machine should not move.
7. Move the directional control to the NEUTRAL position.
8. Reduce the engine speed to LOW IDLE. Engage the parking brake. Lower all attachments to the ground. Apply a slight down pressure. Stop the engine.

NOTICE
If the machine moved while testing the brakes, contact your Caterpillar dealer. Have the dealer inspect and, if necessary, repair the service brake before returning the machine to operation.

i02229253

Bulldozer Tilt Brace and Tilt Cylinders - Lubricate

SMCS Code: 5104-086; 6050-086; 6074-086

Lubricate the two fittings with CAT multipurpose type grease with molybdenum disulfide (MPGM).

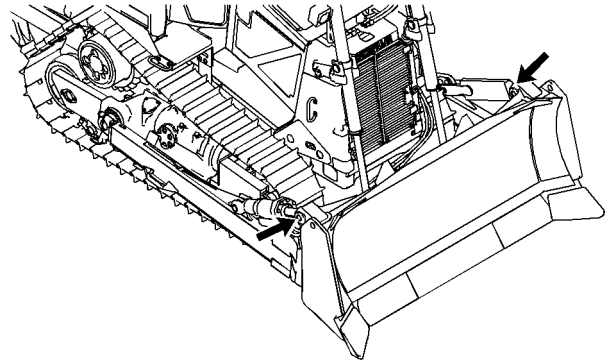


Illustration 196 g01117177

One fitting is located at the left front brace assembly or left tilt cylinder (if equipped).

The other fitting is located at the rod end of the right tilt cylinder.

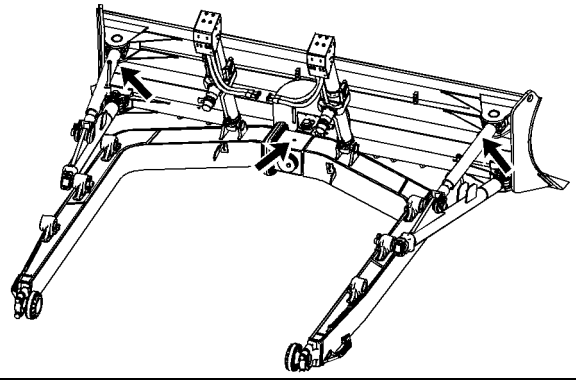


Illustration 197 g01117220

All of the locations for the grease fittings on the angle blade are shown here.

The angle blade has an additional grease fitting that needs to be greased with MPGM.

Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for more information about MPGM.

i03418420

Cab Filter (Fresh Air) - Clean/Inspect/Replace

SMCS Code: 7342-040; 7342-070; 7342-510

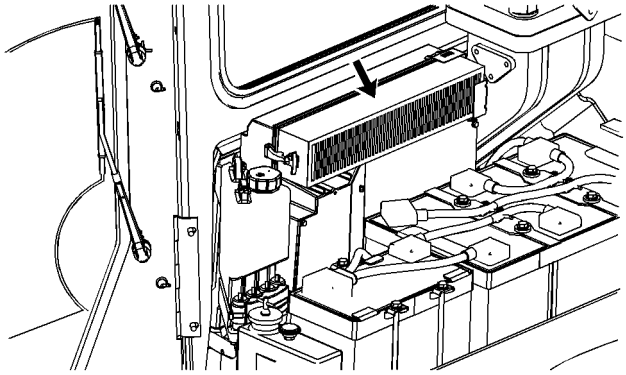


Illustration 198 g01118586

1. Open the access cover to the filter element. The filter cover is on the left side of the machine next to the battery compartment.

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

2. The filter element can be cleaned by using pressure air. Use a maximum air pressure of 205 kPa (30 psi). Direct the air from the clean side to the dirty side.

3. Look through the filter toward a bright light. Inspect the element for damage. Inspect the gaskets for damage. Replace damaged filters.

4. Install the filter element.

5. Close the access covers.

Note: Clean the filters more often in dusty conditions.

Cab Filter (Fresh Air)

Clean/Inspect/Replace

KPZ3226 - UP

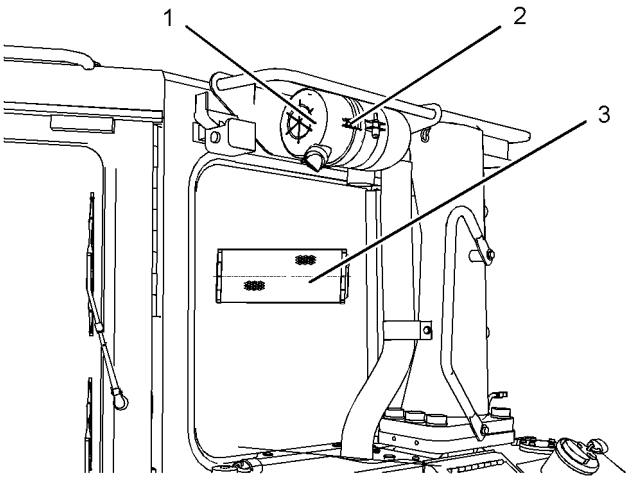


Illustration 199 g01770933

Note: Use three-point contact when you remove the cab filter (fresh air).

Reference: See Operation and Maintenance Manual, “Mounting and Dismounting” for more information.

1. The filter cover (1) is located near the top of the window on the left side of the cab. Loosen three clamps (2) and remove the filter cover .
2. Remove filter element (3).

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

3. The filter element can be cleaned by using pressure air. Use a maximum air pressure of 205 kPa (30 psi). Direct the air from the clean side to the dirty side.
4. Look through the filter toward a bright light. Inspect the element for damage. Inspect the gaskets for damage. Replace damaged filters.
5. Install filter element (3) and install filter cover (1). Close three clamps (2).

Note: Use three-point contact when you install the cab filter (fresh air).

Note: Clean the filters more often in dusty conditions.

i01971627

Cab Filter (Recirculation) - Clean/Inspect/Replace

SMCS Code: 7342-040; 7342-070; 7342-510

The recirculation filter is positioned to the left of the operator's seat in the cab.

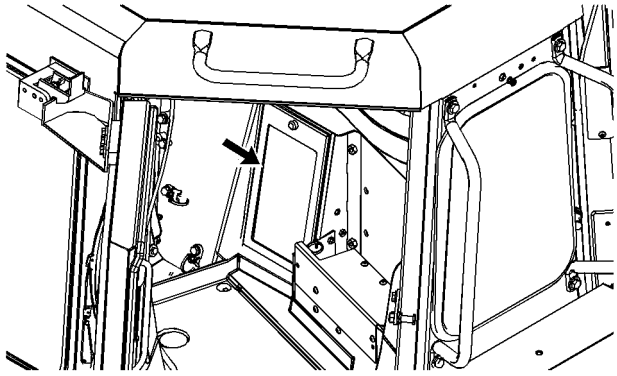


Illustration 200 g01023431

Top view of the inside of cab

1. Unscrew the bolt to the cover of the recirculation filter and remove the cover. Remove the recirculation filter element.

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

2. The recirculation filter element can be cleaned by using pressure air. Use a maximum air pressure of 205 kPa (30 psi). Direct the air from the clean side to the dirty side.
3. Look through the filter toward a bright light. Inspect the element for damage. Inspect the gaskets for damage. Replace damaged filters.
4. Install the recirculation filter element. Make sure that the filter element is centered. If the filter is not centered the system will not function properly.

Note: Clean the filters more often in dusty conditions.

i03400783

Cooler Cores and A/C Condenser - Clean

SMCS Code: 1064-070; 1353-070; 1374-070; 7320-070

Cooler Cores

The following cooler cores are cooled by the hydraulic fan that is located in the radiator guard at the front of the track-type tractor.

Aftercooler core – The aftercooler core cools the inlet manifold air to the engine.

Hydraulic oil cooler core – The hydraulic oil cooler core cools hydraulic oil.

Radiator core – The AMOCS radiator cores cool the engine coolant.

A/C Condenser Core – The air conditioning condenser core cools the refrigerant in the air conditioning system.

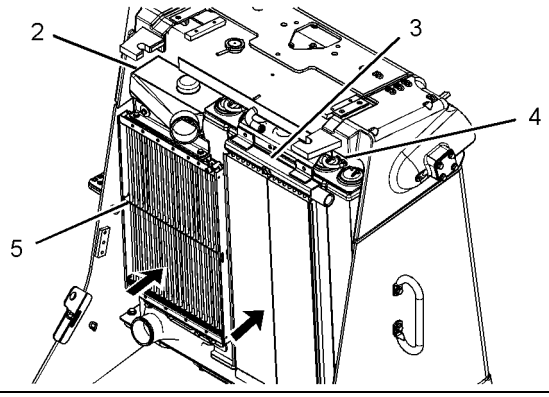


Illustration 201 g01385727

Air conditioner condenser behind the aftercooler

(2) Aftercooler core
(3) Hydraulic oil cooler core
(4) Radiator cores (AMOCS)
(5) A/C condenser core

Aftercooler Core

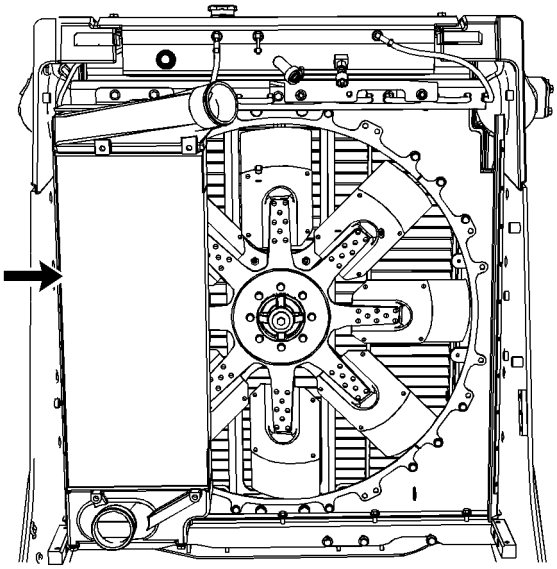


Illustration 202 g01953704

Rear view of aftercooler

Radiator Core

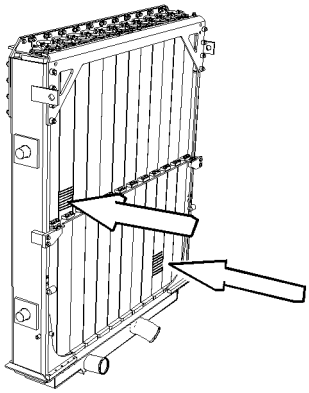


Illustration 203 g01307600

You can use compressed air, high pressure water, or steam to remove dust and other debris from the radiator core. However, the use of compressed air is preferred.

See Special Publication, SEBD0518, “Know Your Cooling System” for the complete procedure for cleaning the radiator core.

A/C Condenser Core

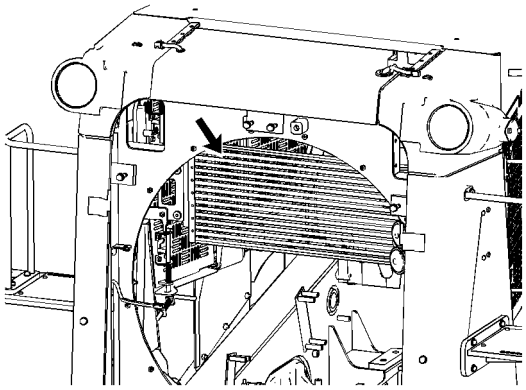


Illustration 204 g01060198

A common arrangement for the air conditioner condenser is located behind the radiator.

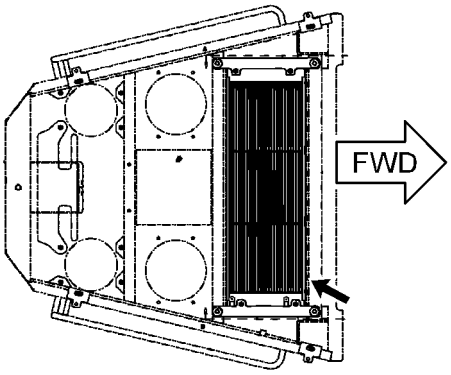


Illustration 205 g01224464

Another arrangement for the air conditioner condenser is located under the hood.

Remote A/C Condenser Core

In some machine arrangements, the a/c condenser core is remotely located. A remote mounted a/c condenser core is cooled by fans with electric drive.

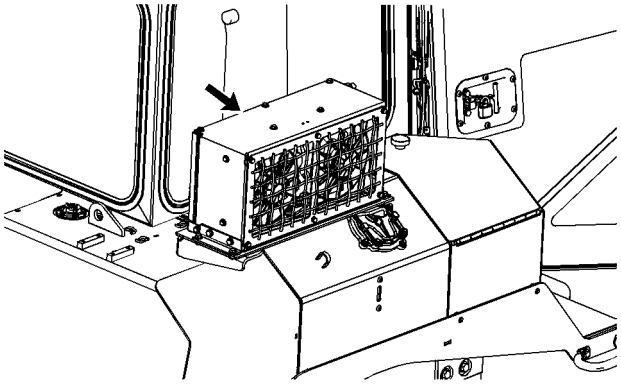


Illustration 206 g01117118

Air conditioner condenser on the right side of the machine

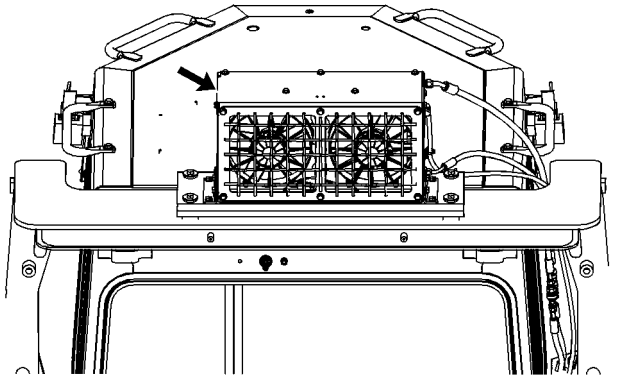


Illustration 207 g01117129

Air conditioner condenser on the top of the machine

Inspect

Note: Adjust the frequency of inspection according to the effects of the operating environment.

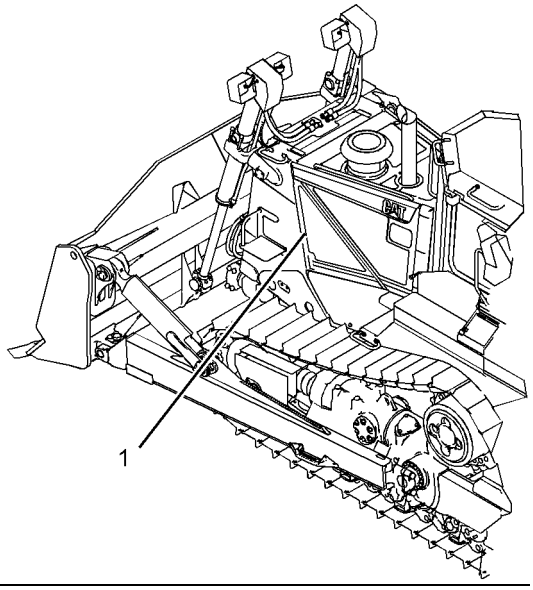


Illustration 208 g01385726

Turn off the engine.

Open both of engine access doors (1).

Inspect the cooling system for the following conditions: coolant leaks, oil leaks, damaged fins, and tubes. Inspect the following parts of the cooling systems: air lines, connections, and clamps for damage. Make repairs for damage, if necessary.

Note: If parts of the aftercooler system may appear to be damaged or if parts of the aftercooler system are repaired, a leak test is highly recommended. Refer to Special Instruction, SEHS8622, “Using the FT1984 Air-to-Air Aftercooler Leak Test Group”. The FT-1984 Aftercooler Testing Group can be used for aftercoolers that have hoses with an inside diameter of 102 mm (4.00 inches) or 114 mm (4.50 inches).

For more detailed information on testing and inspection, see Special Publication, SEBD0518, “Know Your Cooling System”.

Clean

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

Radiator cores, aftercooler cores, hydraulic oil cooler cores, and a/c condenser cores needed to be cleaned regularly. Adjust the frequency of cleaning according to the effects of the operating environment.

Blow out the cores with compressed air. Move the air nozzle in a systematic pattern so that the air flow covers the whole core that includes areas in the corner. Clean the middle space between the aftercooler core and the a/c condenser core. Also, clean the space between the hydraulic oil cooler and the AMOCS radiator cores.

Use a bent copper tube that is approximately 1/4 -3/8 inch diameter as an extension to the air nozzle. This will facilitate cleaning of the middle spaces.

Do not use steam or high pressure water for cleaning frequently. If steam or high pressure water is required to dislodge any debris that is held deep in the cores, make sure that the cleaning is thorough. This may require partial removal or total removal of the hydraulic oil cooler and the air conditioner condenser for better access. Incomplete cleaning with water may cause remaining debris to harden in place. Use lights and wire probes in order to ensure that the cleaning is thorough and complete. If the debris has hardened in the center of the cores, these cores may need to be removed for thorough cleaning.

If you use a degreaser and steam for removal of oil and grease, wash the core with detergent and hot water. Thoroughly rinse the core with clean water. Dry the cores completely before operating the machine in the work mode.

Dry

If steam or water is used to clean the cores, make sure that the cores are completely dry before the track-type tractor is put back to work.

Use compressed air to blow dry the wet cores, the engine, engine access doors, and the hood.

Close both engine access doors.

If the machine is in a clean environment, start the engine and allow the fan to run until the cooling system has completely dried. Allow the machine to sit overnight before operating the machine in the work mode.

Wood Chip or Waste Handling Arrangement (If Equipped)

Cooler Cores

The wood chip and waste handling arrangements have a remote mounted a/c compressor, and a single plane of the following cores: hydraulic oil cooler core, AMOCS radiator cores, and aftercooler core. Additionally, these arrangements have a hydraulic fan that reverses the direction of air flow in order to purge debris.

Clean

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

NOTICE

Pressurized air: To avoid possible engine damage, shut off engine before performing maintenance to clean the cooling system. Install air nozzle into access slot before starting air supply. Read and understand Operation and Maintenance Manual.

In applications with high levels of airborne debris, a regular schedule for cleaning the cooling cores must be established. The frequency of cleaning and the method of cleaning must be tailored to the specific debris accumulation on the job site. In order to maintain clean cores, the cleaning will need to be done at least daily. Cleaning may be needed on a more frequent basis. The clean out schedule must be followed even when ambient temperatures are low. This will prevent debris accumulation in the cores and future plugging.

Access to the cores is through the engine access doors from the rear of the cores which results in blowing air in the same direction as the normal air flow through the fan. The wood chip and Waste Handling arrangements offer two options for blowing air in the opposite direction of normal fan air flow. First, the reverse fan function has a continuous reverse mode. This allows prolonged periods of the reverse flow while the machine is parked. Next, slots are provided in both sides of the radiator guard for use with a 307 - 6728 Air Nozzle which concentrates air flow backward through the cores.

Blow out the cores with compressed air. Move the air nozzle in a systematic pattern so that the air flow covers the whole core that includes the areas in the corners. Do not use steam or high pressure water for cleaning frequently. If steam or high pressure water is required to dislodge any debris that is held deep in the cores, make sure that the cleaning is thorough. This may require opening radiator doors and removing debris guards for access. Incomplete cleaning with water may cause remaining debris to harden in place. Use lights and wire probes in order to ensure that the cleaning is thorough and complete. If the debris has hardened in the center of the cores, these cores may need to be removed from the machine for thorough cleaning. If steam or water pressure is used to clean the cores, make sure that the pressure is controlled in order to prevent the fins from bending.

If you use a degreaser or special cleaning agents, wash the core with detergent and hot water. Thoroughly rinse the core with clean water. Dry the cores completely before operating the machine in the work mode.

Dry

If steam or water is used to clean the cores, make sure that the cores are completely dry before the track-type tractor is put back to work.

Use compressed air to blow dry the wet cores, the engine, engine access doors, and the hood.

Close both engine access doors.

If the machine is in a clean environment, start the engine and allow the fan to run continuously in the reverse mode until the cooling system has completely dried. Allow the machine to sit overnight before operating the machine in the work mode.

Typical Cleaning Procedure That Uses Compressed Air

The wood chip and waste handling arrangements have special cleaning features.

- continuous reverse fan function
- 307 - 6728 Air Nozzle in access slots in the radiator guard

These tools can be used to develop a cleaning procedure that best suits your application. One possible sequence for cleaning is outlined below.

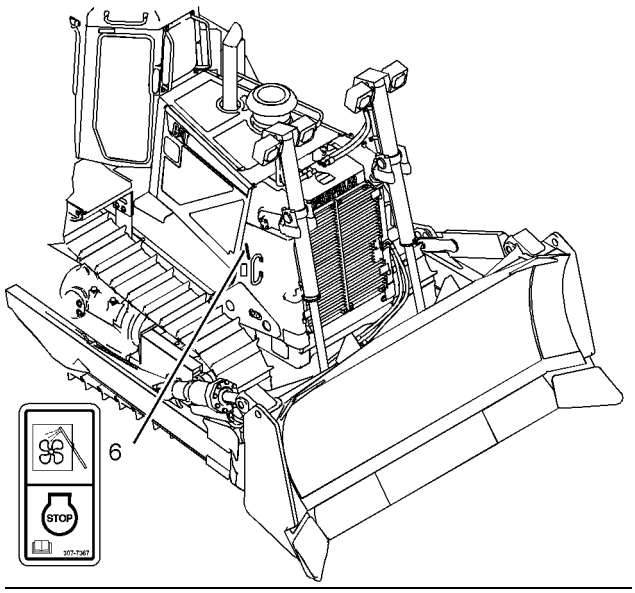


Illustration 209 g01385729

1. At the proper cleaning area, park the machine in NEUTRAL and engage the parking brake.
2. Depress the fan control switch and hold for three seconds in order to enter the continuous reverse mode. Run the fan in the reverse mode continuously for 2 minutes.
3. Turn off the engine. Make sure that the fan has stopped rotation.

4. Open both of engine access doors (1). Use a regular air nozzle to clean the cores from the rear side. Blow off the hood, engine access doors, and the entire engine compartment. On machines that are equipped with the woodchip arrangement, open the grill doors and blow off the shelf of the radiator guard.

5. Open the cover to access slot (6) on both sides of the radiator guard. Insert the 307-6728 Air Nozzle into the access slot on the right side of the machine in order to clean the cores on the left side of the machine.

Note: Cleaning the cores from the opposite side of the machine allows better cleaning in the corners.

6. Turn on the air supply.

Note: Do not activate the air supply until you have inserted the air nozzle into the access slot. Use the work tool safely.

7. Move the air nozzle in a pattern in order to clean the cores from the front side of the cores. Blow out the cores on the left side of the cooling system.

8. Turn off the air supply when the nozzle cleaning of the left side cores is completed.

9. Remove the air nozzle from the access slot. Close the access cover.

10. Repeat Steps 5 through 9 from the left side of the machine in order to clean the cores on the right side of the machine.

11. Use a regular air nozzle in order to blow off the cores from the rear and clean the entire engine compartment.

12. Close both of the engine access doors.

13. Restart the engine. Operate the fan in the forward direction continuously for 2 minutes.

14. Reverse the air flow. Operate the fan in the reverse mode continuously for 2 minutes.

15. Return to operating the machine in work mode.

Note: Adjust the frequency of cleaning according to the effects of the operating environment. Modify the typical cleaning procedure above for optimal results, as needed.

i03571752

Cooling System Coolant Sample (Level 2) - Obtain

SMCS Code: 1350-008; 1395-008; 1395-554; 7542

Level 2 Analysis

NOTICE
Always use a designated pump for oil sampling, and use a separate designated pump for coolant sampling. Using the same pump for both types of samples may contaminate the samples that are being drawn. This contaminate may cause a false analysis and an incorrect interpretation that could lead to concerns by both dealers and customers.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Testing the coolant can be done at your Caterpillar dealer. Caterpillar S·O·S Coolant Analysis is the best way to monitor the condition of your coolant and your cooling system. S·O·S Coolant Analysis is a program that is based on periodic samples. See Operation and Maintenance Manual, SEBU6250, “Cooling System Specifications”, “General Coolant Information” for more information.

Perform a Coolant Analysis (Level 2) at initial 500 hours for systems that contain extended life coolant (ELC). Perform the analysis yearly after the initial 500 hours.

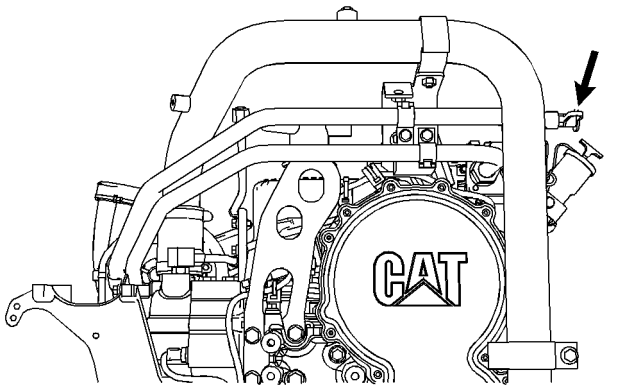


Illustration 210 g01755673

1. Park the machine on a hard, level surface. Set the engine at low idle speed.

2. Open the left side engine compartment. Remove the protective cap from the sampling valve.

3. Obtain a sample. For additional information about coolant analysis, see Operation and Maintenance Manual, SEBU6250, “Cooling System Specifications”, “General Coolant Information” or consult your Caterpillar dealer.

4. Replace the protective cap. Close the left side engine compartment.

Submit the sample for Level 2 analysis.

i03398001

Cooling System Coolant (ELC) - Change

SMCS Code: 1395-044

For information about adding an extender to your cooling system, see the Topic “Cooling System Coolant Extender (ELC) - Add” in this manual or consult your Caterpillar dealer.

NOTICE
Make sure you read and understand the information in the topics Safety and Cooling System Specifications for all information pertaining to water, antifreeze and supplemental coolant additive requirements before you proceed with maintenance of the cooling system.

To Drain the Cooling System

The filler cap is located inside the access door on the top of the radiator guard.

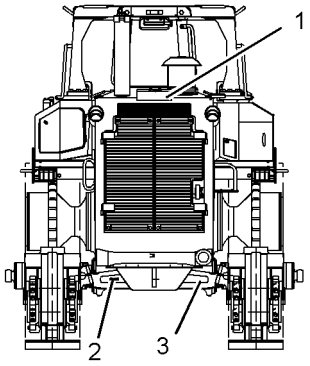


Illustration 211 g01113455

WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove filler cap slowly to relieve pressure only when engine is stopped and radiator cap is cool enough to touch with your bare hand.

Cooling System Conditioner contains alkali. Avoid contact with skin and eyes.

1. Slowly loosen filler cap (1) in order to relieve system pressure. Remove the filler cap.

2. Remove right access cover (2) and left access cover (3) for the coolant drain. One cover is located on the front right side of the machine, bottom guard. The other cover is on the left side of the machine, bottom guard.

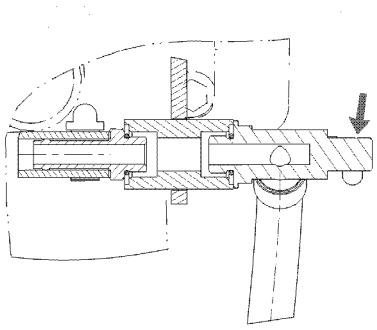


Illustration 212 g01017961

3. Direct the drain hoses into suitable containers.

4. Open the drain valve. Allow the coolant to drain into a suitable container.

5. Flush the system with water. Flush the system until the draining water is clear.

Note: If the cooling system is already using ELC, cleaning agents are not required to be used at the specified coolant change interval. Cleaning agents are only required if the system has been contaminated by the addition of some other type of coolant or by cooling system damage. Clean water is the only cleaning agent that is required when ELC is drained from the cooling system.

Note: If you change to an ELC from another type of coolant, use a Caterpillar cleaning agent to flush the cooling system. After you drain the cooling system, thoroughly flush the cooling system with clean water. **All of the cleaning agent must be removed from the cooling system.** Refer to the Topic “Cat Extended Life Coolant (ELC)” in Operation and Maintenance Manual, SEBU6250.

6. Close the drain valves and install the plug.

7. Replace the access covers.

8. Add the ELC solution. See the following topics in this publication:

   - Cooling System Specifications
   - Capacities (Refill)

Note: Caterpillar antifreeze contains additives. If you are using Caterpillar antifreeze, do not add the supplemental coolant additive at this time. Also, do not change the supplemental coolant additive element at this time.

9. Start the engine. Run the engine without the filler cap until the thermostat opens and the coolant level stabilizes.

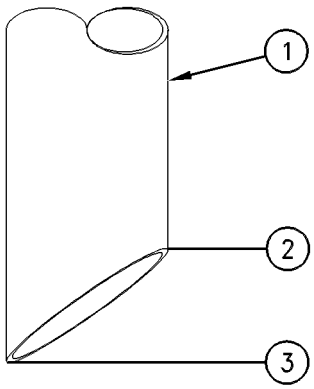


Illustration 213 g00475722

10. Look into filler tube (1). Maintain coolant level between area (2) and area (3) of the filler tube. Adding coolant above this area of the filler tube will cause the coolant to overflow the cooling system.

11. If the gasket is damaged, replace the filler cap. Install the filler cap.

12. Stop the engine.

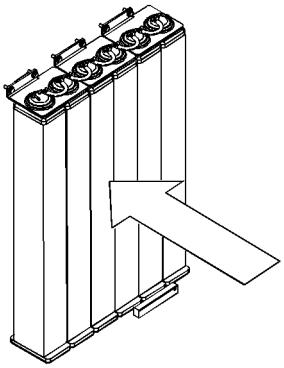


Illustration 214 g01117259

13. Clean the radiator cores with compressed air. You may need to use water in order to remove debris.

14. Allow the radiator cores to dry completely before operating the machine in the work mode.

    Reference: See Operation and Maintenance Manual, “Cooler Cores and A/C Condenser - Clean” for information on a typical cleaning procedure.

For additional information about the cooling system coolant, see Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Cat Extended Life Coolant (ELC)” or consult your Caterpillar dealer.

i03396142

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352-538; 1395-538

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Table 20

“Cat ELC Extender” and the Cooling System Capacity	
Cooling System Capacity	Recommended Amount of “Cat ELC Extender”
84 L to 114 L (22 to 30 US gal)	2.15 L (72 oz)

When a Caterpillar Extended Life Coolant (ELC) is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, “Maintenance Interval Schedule” for the proper service interval. The amount of extender is determined by the cooling system capacity.

For additional information about adding an extender, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

Extended Life Coolant (ELC) Extender

Use a 8T-5296 Coolant Conditioner Test Kit to check the concentration of the coolant.

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove filler cap slowly to relieve pressure only when engine is stopped and radiator cap is cool enough to touch with your bare hand.

Cooling System Conditioner contains alkali. Avoid contact with skin and eyes.

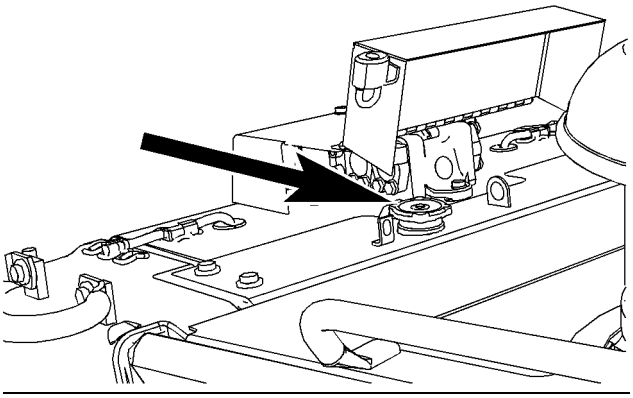


Illustration 215 g01757656

1. The filler cap is located inside the access door on the top, left side of the radiator guard. Loosen the radiator cap slowly in order to relieve pressure. Remove the radiator cap.

2. It may be necessary to drain some coolant from the radiator so that Extender can be added to the cooling system.

Note: Always discard drained fluids according to local regulations.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide”, for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

3. Add 2.15 L (72 oz) of Extender to the cooling system.

4. Start the engine. Run the engine without the filler cap until the thermostat opens and the coolant level stabilizes. Check for leaks.

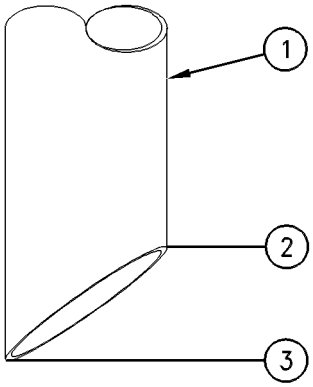


Illustration 216 g00475722

5. Look into filler tube (1). If necessary, add premixed coolant in order to correct the coolant level. Maintain the coolant level between area (2) and area (3) of the filler tube. Adding coolant above this area of the filler tube will cause the coolant to overflow the cooling system.

6. Replace the radiator cap if the cap gasket is damaged. Install the radiator cap.

i03396143

Cooling System Coolant Level - Check

SMCS Code: 1353-535-FLV; 1395-535-FLV

⚠ WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

This machine's radiator has a surge tank. There is no top tank in this cooling system. The surge tank has a filler cap and a sight glass. It is not necessary to remove the filler cap in order to check the coolant level. The sight glass is inside the engine compartment that is on the front left side of the machine. The filler cap is beneath the access door that is on the top left side of the radiator guard.

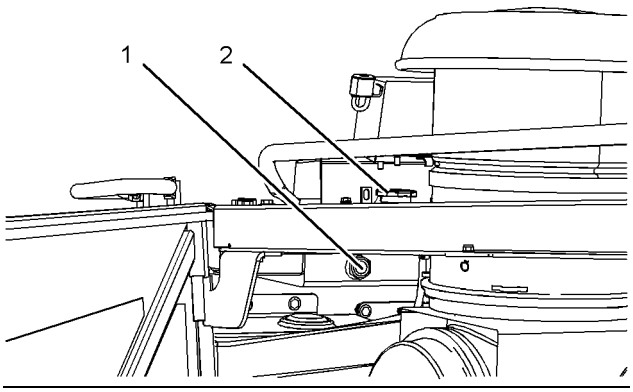


Illustration 217 g01759106

1. Observe the sight glass (1) in order to verify the level of the coolant. If the coolant completely covers the sight glass, the coolant level is okay. If the coolant level is visible in the sight glass, the coolant is low. Add coolant in order to fill the system.

2. If it is necessary to add coolant, remove the filler cap (2) slowly in order to relieve the pressure.

Note: The factory fill is Extended Life Coolant (ELC). Refer to Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations” for additional information. Maintaining the system as ELC is preferred. See the sections “Coolant Recommendations” and “ELC Cooling System Maintenance”.

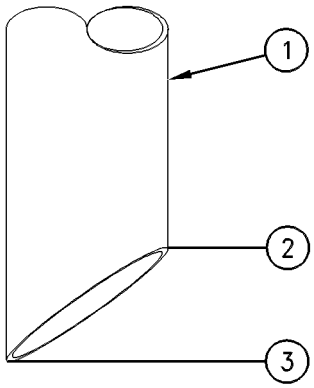


Illustration 218 g00475722

3. Look into filler tube (1). Maintain the coolant level between area (2) and area (3) of the filler tube. Adding coolant above this area of the filler tube will cause the coolant to overflow the cooling system. If you need to add coolant daily, check the cooling system for leaks.

4. Inspect the filler cap and the filler cap seal for debris, for foreign material, or for damage. Clean the filler cap with a clean cloth. Replace the radiator cap if the filler cap is damaged.

5. Install the filler cap.

6. Inspect the radiator core for debris. Clean the radiator core, if necessary.

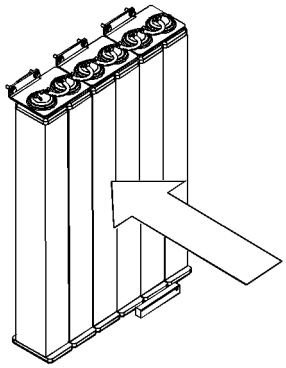


Illustration 219 g01117259

Use compressed air, high pressure water, or steam to remove dust and debris from the radiator core. However, the use of compressed air is preferred.

Allow the radiator cores to dry completely before operating the machine in the work mode.

Wood Chip or Waste Handling Arrangement (If Equipped)

Clean the Radiator Cores

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

NOTICE

Pressurized air: To avoid possible engine damage, shut off engine before performing maintenance to clean the cooling system. Install air nozzle into access slot before starting air supply. Read and understand Operation and Maintenance Manual.

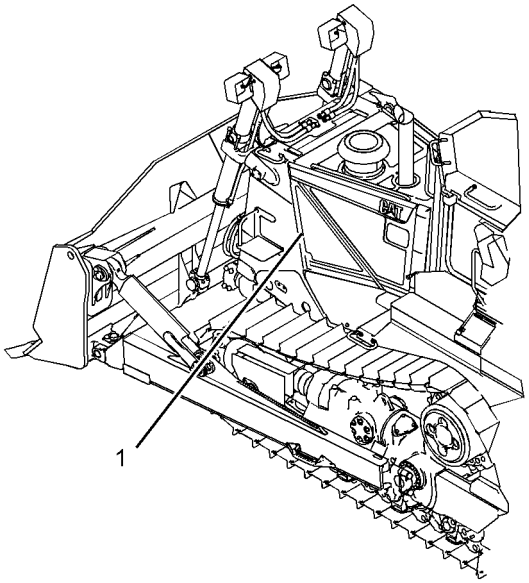


Illustration 220 g01382652

Wood chip or waste handling arrangement (if equipped)

Some components are removed for clarity.

Use 307-6728 Air Nozzle (1) (not shown) in order to clean debris from the cooling system. Use the work tool safely.

1. Turn off the engine.

   a. Make sure that the fan has stopped rotation.

2. Open the cover to the access slot (2) on the right side of the radiator guard.

3. Insert the air nozzle into the slot.

4. Turn on the air supply.

5. Move the air nozzle in a sufficient pattern to clean debris from the cooling system which includes the radiator cores.

   a. Turn off the air supply when the nozzle cleaning is completed.

6. Remove the air nozzle from the slot. Close the access cover.

After cleaning, start the engine and accelerate the engine to high idle rpm. This will help in the removal of debris and drying of the core, if necessary. Stop the engine. Inspect the core for cleanliness. Repeat the cleaning, if necessary.

i01958847

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510

NOTICE
Failure to replace the engine's thermostat on a regularly scheduled basis could cause severe engine damage.

NOTICE
Replace the thermostat on a regular basis in order to reduce the chance of unscheduled downtime and of problems with the cooling system.

A new thermostat should be installed after the cooling system has been cleaned. Install the thermostat while the cooling system is completely drained or while the cooling system coolant is drained to a level that is below the thermostat housing.

NOTICE
Since Caterpillar engines incorporate a shunt design cooling system, it is mandatory to always operate the engine with a thermostat.

Depending on load, failure to operate with a thermostat could result in either an overheating or an overcooling condition.

Reference: Refer to Disassembly and Assembly, “Water Temperature Regulator - Remove” and Disassembly and Assembly, “Water Temperature Regulator - Install” for more information. Fill the engine cooling system. Refer to Operation and Maintenance Manual, “Caterpillar Machine Fluids Recommendations” and Operation and Maintenance Manual, “Capacities (Refill)”.

i01959143

Cutting Edges and End Bits - Inspect/Replace

SMCS Code: 6801-040; 6801-510; 6804-040; 6804-510

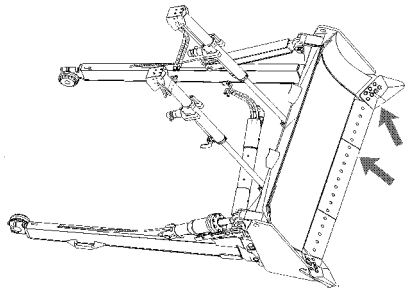


Illustration 221 g01018242

1. Raise the bulldozer blade and block up the bulldozer blade. When you remove the cutting edges and the end bits, maintain the bulldozer blade at a minimum height.

2. Remove the bolts. Then remove the cutting edge and the end bits.

3. Thoroughly clean all contact surfaces.

4. Inspect the opposite side of the cutting edge. If the opposite side of the cutting edge is not worn, turn the opposite side of the cutting edge outward and install the cutting edge.

5. If both sides of the cutting edge are worn, install a new cutting edge section.

Note: When the cutting edge is within 10 mm (0.4 inch) of the bottom of the support, change the cutting edge. **Do not allow wear to occur on the support.**

6. If the bottom edge or the outside edge of the end bit is worn, install a new end bit.

Note: When the end bit is within 10 mm (0.4 inch) of the bottom of the support, change the end bit. When the end bit is within 10 mm (0.4 inch) of the outside edge of the support, change the end bit. **Do not allow any wear to occur on the support.**

7. Install all bolts and tighten the bolts to a torque of 1150 ± 150 N·m (850 ± 110 lb ft). Refer to Specifications, SENR3130, “Torque Specifications”, “Torques for Ground Engaging Tools”.

8. Raise the bulldozer blade and remove the blocking. Lower the bulldozer blade to the ground.

9. After you operate the machine for a few hours, check all bolts for proper torque.

i02061807

Electronic Unit Injector - Inspect/Adjust

SMCS Code: 1290-025; 1290-040

⚠ WARNING

The Electronic Control module produces high voltage. To prevent personal injury make sure the Electronic Control Module is not powered and the unit injector solenoids are disconnected.

NOTICE
The camshafts must be correctly timed with the crankshaft before an adjustment of the unit injector lash is made. The timing pins must be removed from the camshafts before the crankshaft is turned or damage to the cylinder block will be the result.

The operation of Caterpillar engines with improper adjustments of the electronic unit injector can reduce engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

Adjust the electronic unit injector at the same interval as the valve lash adjustment.

Refer to your machine's Service Manual or your Caterpillar dealer for the complete adjustment procedure.

i03619440

Engine Air Filter Primary and/or Secondary Element - Clean/Replace

SMCS Code: 1054-070-SE; 1054-070-PY; 1054-510-PY; 1054-510-SE

Primary Filter

NOTICE
Service the primary filter element only when the alert indicator for the intake air filter is flashing. Do not open the filter compartment unless it is time for service. Opening the filter compartment can cause dirt to get into the clean side of the filter housing.

NOTICE
Extremely short air filter life can result if the precleaner system malfunctions. If air filter life is drastically reduced from typical for the operating conditions, consult your Caterpillar Dealer. The exhaust system dust ejector for the strata tube precleaner must pull a minimum vacuum of 508 mm (20 inch) of water.

NOTICE
Service the engine air filters with the engine stopped. Engine damage could result.

NOTICE
Always leave the secondary filter element in place while you clean the primary element, or while you clean the air cleaner housing.

NOTICE
Do not use the filter for longer than one year.

1. Open the engine compartment's access door, if equipped.

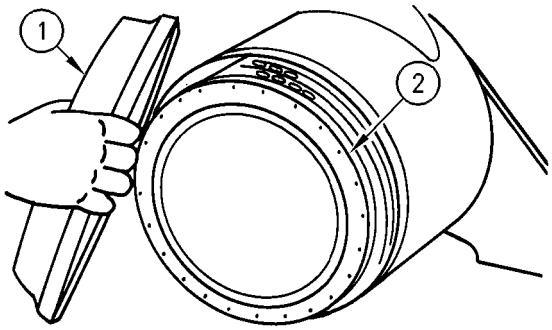


Illustration 222 g00470852

2. Remove the air cleaner cover (1). Pull out in order to remove the element.

3. Remove the primary filter element (2) from the air cleaner housing.

4. Mark the secondary filter element in order to show that the primary filter element has been serviced. The secondary filter element should be replaced when the primary filter element is serviced for the third time. Refer to the section “Secondary Filter”.

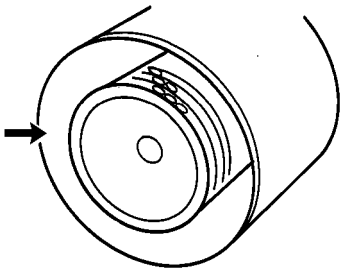


Illustration 223 g00470857

5. Clean the inside of the air cleaner housing. Keep the secondary filter element in place while you clean the housing.

6. If the primary filter element has not been cleaned six times, inspect the primary filter element. If the primary filter element has been cleaned six times, replace the primary filter element. Proceed to Step 9.

7. Inspect the primary filter element. Inspect the filter element for holes and for tears by looking through the filter element. Look toward a bright light. Inspect the element for damaged gaskets or for dented metal parts. Replace damaged filters. Always crush damaged filter elements. Properly discard the filter elements. If you replace the primary filter element, proceed to step 9.

8. If the primary filter element is not damaged and the element has not been previously cleaned six times, clean the element. The filter element can be cleaned by using pressure air. Use a maximum air pressure of 205 kPa (30 psi). Direct the air from the clean side to the dirty side. In order to show that the filter element has been cleaned, mark the element. The primary filter element can be cleaned up to six times.

NOTICE
Do not clean the filter elements by bumping or tapping them. Do not use filter elements with damaged pleats, gaskets, or seals. Do not wash the filter elements.

9. Push the filter element firmly in order to properly seat the element. Write the date on the element, if the primary element is replaced.

10. Install the air cleaner cover.

11. Close the access door, if equipped.

Secondary Filter

NOTICE
Always replace the secondary filter element. Never attempt to reuse it by cleaning.

The secondary filter element should be replaced at the time the primary element is serviced for the third time.

The secondary filter element should also be replaced if the yellow piston in the filter element indicator enters the red zone after installation of a clean primary element, or if the exhaust smoke is still black.

NOTICE
The filter should be kept in service for no longer than one year.

NOTICE
Always leave the secondary filter element in place while you clean the air cleaner housing.

1. Open the engine access door, if equipped.

2. Remove the air cleaner housing cover.

3. Remove the primary filter element. Refer to the section “Primary Filter”.

4. Clean the inside of the air cleaner housing.

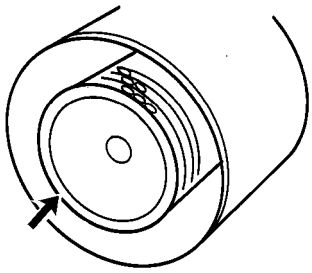


Illustration 224 g00470240

5. Remove the secondary filter element. Pull out in order to remove the element.

6. Install a new secondary filter element. Push the element firmly in order to properly seat the element. Write the date on the element, if the element is replaced.

7. Install the primary filter element and the air cleaner housing cover.

8. Close the engine access door, if equipped.

i01959145

Engine Air Precleaner - Clean

SMCS Code: 1055-070

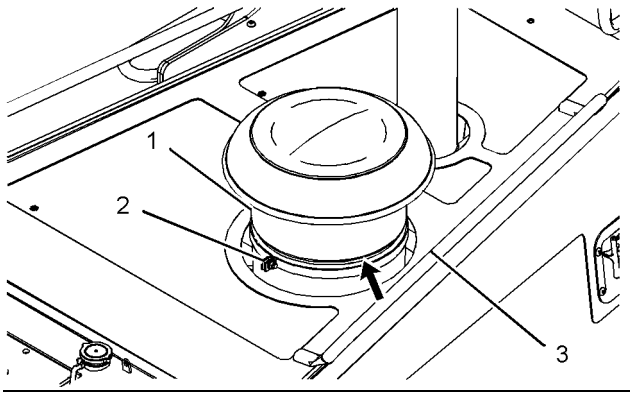


Illustration 225 g01018245

1. Inspect the screen in engine air precleaner (1) that sits above engine hood (3) for dirt accumulation.

2. Loosen retainer (2) and remove the screen.

3. Clean the screen with compressed air or water.

4. Replace the screen.

i02760299

Engine Crankcase Breather - Clean

SMCS Code: 1317-070

1. Stop the engine. Open the left access door.

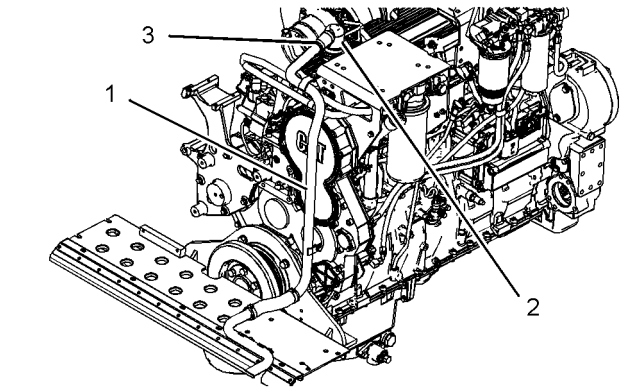


Illustration 226 g01124723

Top view

2. Loosen the hose clamps on the outlet hose from the breather. Remove the hose from the breather assembly.

3. Remove the clamp from the base of the breather assembly.

4. Lift up on the breather assembly, in order to remove the assembly.

5. Check the condition of the cover seal. Replace the cover seal if the cover seal is damaged.

6. Clean the breather in a clean nonflammable solvent.

7. Shake the breather until the breather is dry. You may also use pressure air to dry the breather.

8. Check the condition of the hose. Make sure that the inside of the hose is unobstructed. Replace the hose if the hose is damaged.

9. Install breather assembly (2).

10. Install clamp (3).

11. Install the hose and breather outlet hose clamps (1).

12. Open the doors to the radiator grill. Examine the bottom of the breather. Remove any debris that is clogging the breather tube.

13. Close the doors to the radiator grill.

14. Close the left access door.

i02195435

Engine Mounts and Equalizer Bar - Inspect

SMCS Code: 1152-040; 7206-040

Engine Mounts

Caterpillar recommends checking the engine mounts for deterioration. This will prevent excessive engine vibration that is caused from improper mounting.

Equalizer Bar End Pins

⚠ WARNING

Personal injury or death can occur from not following the proper procedure or the recommended tooling.

To prevent the possibility of injury or death, follow the established procedure using the recommended tooling.

NOTICE
The machine must be parked on a level surface to perform this procedure.

⚠ WARNING

Personal injury or death can occur from not following the proper procedure or the recommended tooling.

To prevent the possibility of injury or death, follow the established procedure using the recommended tooling.

NOTICE
The machine must be parked on a level surface to perform this procedure.

Note: All the weight of the machine must be removed from the equalizer bar. Equalizer bar must have free movement in order to be measured.

To check the equalizer bar end pin for movement and unusual wear, perform the following steps.

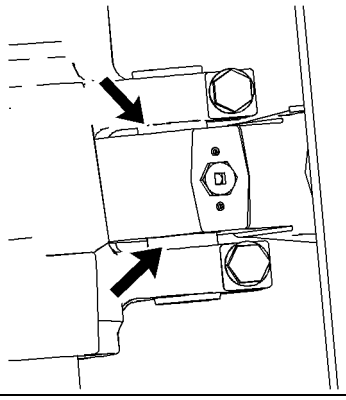


Illustration 227 g01108793

1. Clean the areas that are around the end pin with a high pressure wash. Inspect the condition of the seal.
2. Check the area for oil leakage and a neutral seal position.
3. Check the oil in both end pin joints.

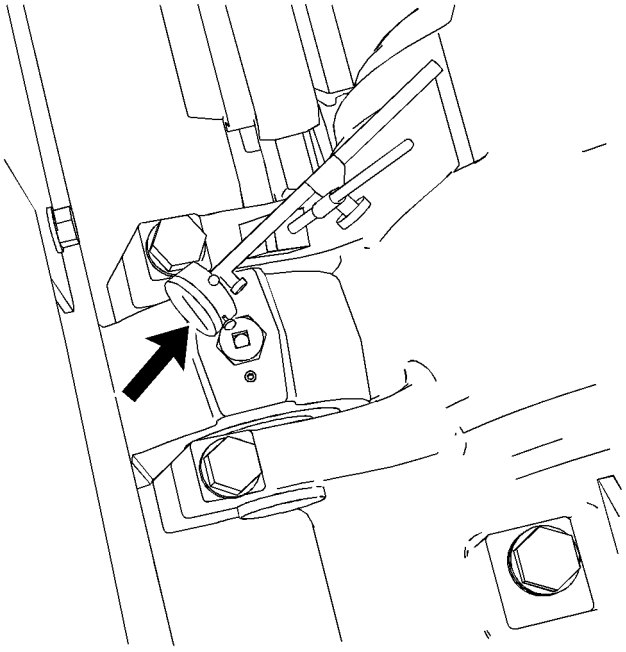


Illustration 228 g01108795

4. Position a dial indicator on the bracket for the pin on the roller frame. Set the dial indicator probe on top of the equalizer bar. Set the dial indicator to zero.

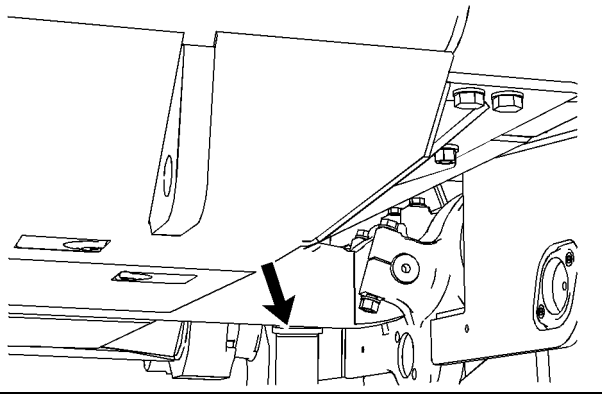


Illustration 229 g01108798

5. Put a 55 ton hydraulic jack in position under the end of the equalizer bar.

6. Jack up the equalizer bar and take a reading on the dial indicator in order to determine the amount of wear.

Note: Schedule the end pin joint for repair if the reading on the dial indicator exceeds 1.50 mm (.059 inch).

7. Repeat the inspection and the measurement procedure for the other end of the equalizer bar and end pin.

Consult your Caterpillar dealer for an inspection and for repair instructions.

Equalizer Bar Center Pin

⚠ WARNING

Personal injury or death can occur from not following the proper procedure or the recommended tooling.

To prevent the possibility of injury or death, follow the established procedure using the recommended tooling.

NOTICE
The machine must be parked on a level surface to perform this procedure.

⚠ WARNING

Personal injury or death can occur from not following the proper procedure or the recommended tooling.

To prevent the possibility of injury or death, follow the established procedure using the recommended tooling.

NOTICE
The machine must be parked on a level surface to perform this procedure.

Note: All the weight of the machine must be removed from the equalizer bar. Equalizer bar must have free movement in order to be measured.

To check the equalizer bar center pin for looseness and for unusual wear, perform the following steps.

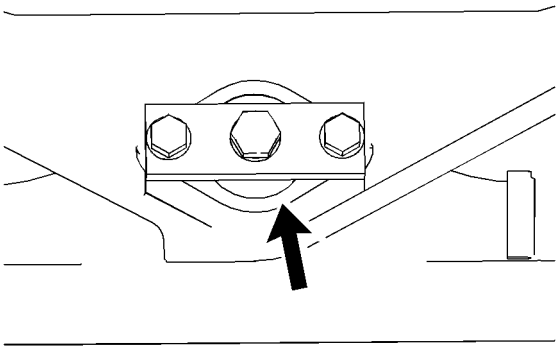


Illustration 230 g01108801

1. Clean the areas that are around the center pin and equalizer bar.

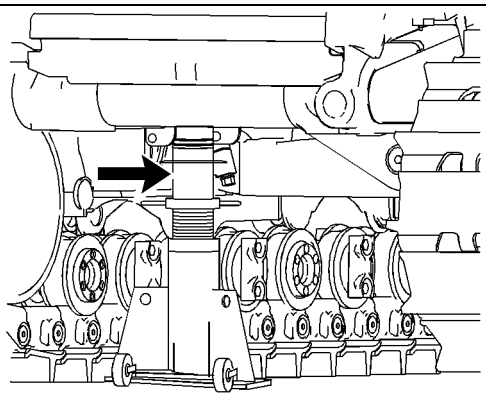


Illustration 231 g01108803

2. Put a 55 ton hydraulic jack in position under the main frame, as shown.

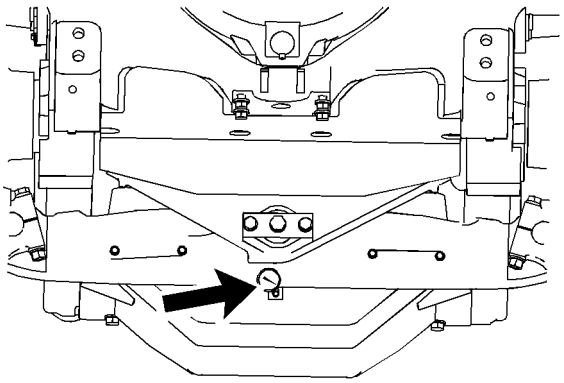


Illustration 232 g01108804

3. Position a dial indicator on the equalizer bar and place the probe of the dial indicator under the center of the frame for the pin. Set the dial indicator to zero.

4. Jack up the front of the machine until the weight of the roller frames are supported by the equalizer bar.

5. Take a reading of the dial indicator in order to determine the amount of wear on the pin and bearing.

Note: Schedule the center pin joint for repair if movement exceeds 2.54 mm (.100 inch).

Consult your Caterpillar dealer for an inspection and for repair instructions.

Equalizer Bar Pads

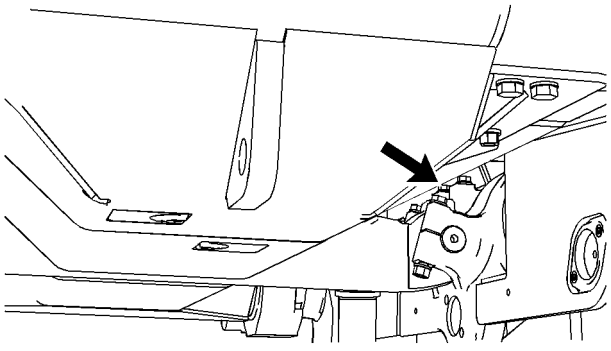


Illustration 233 g01108806

The equalizer bar pads are under the front guard, which is underneath the machine. Inspect the equalizer bar pads for cracked rubber and for missing portions of rubber. Consult your Caterpillar dealer for replacement parts and for replacement instructions.

i01959267

Engine Oil Level - Check

SMCS Code: 1302-535-FLV; 1326-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE
Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

1. Open the engine access door (if equipped) on the left side of the machine.

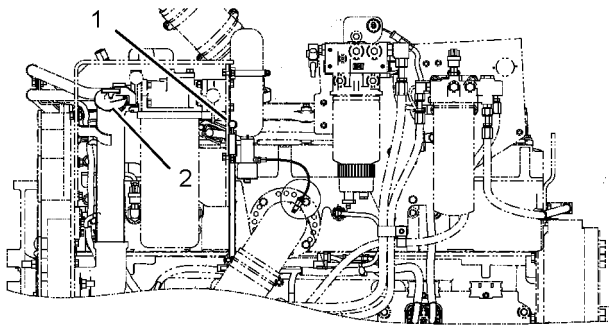


Illustration 234 g01025526

Illustration 235 g00489186

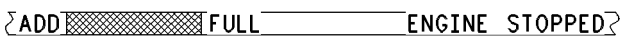


Illustration 236 g00489188

2. Check the “LOW IDLE” side of dipstick (1) while the engine is running. The oil should be at operating temperature. Maintain the oil level between the “ADD” mark and the “FULL” mark. This is the only accurate way to check the oil level.

Check the “ENGINE STOPPED” side of the dipstick while the engine is stopped. The oil should be cold. Maintain the oil level between the “LOW” mark and the “FULL” mark. This method should be used as reference only, before the engine is started.

Note: When you operate the machine on severe slopes, the oil level in the engine crankcase must be at the “FULL” mark on the “LOW IDLE” side of dipstick (1).

3. Remove oil filler cap (2) and add oil, if necessary.

4. Clean the oil filler cap and install the oil filler cap.

5. Close the engine access door (if equipped).

i03399741

Engine Oil Sample - Obtain

SMCS Code: 1348-554-SM; 1348; 7542

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the engine oil as close as possible to the recommended sampling interval. The recommended sampling interval is every 250 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

1. Before you obtain an oil sample, operate the machine until the oil is warm and the oil is well circulated.

2. Open the engine access door (if equipped) on the left side of the machine.

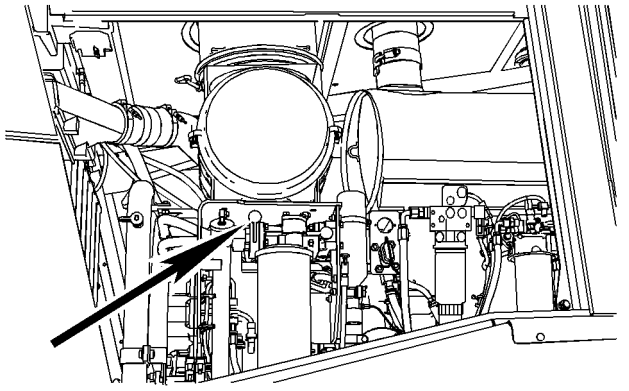


Illustration 237 g01760274

3. Remove the protective cap.

4. Obtain a sample of the engine oil from the engine oil sampling valve. The sampling valve is located in the engine compartment on the left side of the machine. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the engine oil.

Note: In order to obtain an oil sample from the engine compartment, it may be necessary to increase the engine's speed. Normally, the oil sample is taken at low idle. If the flow rate is too low, increase engine speed to high idle in order to obtain the oil sample.

5. Replace the protective cap.

6. Close the engine access door (if equipped).

For additional information about oil sampling, see Operation and Maintenance Manual, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i02771121

Engine Oil and Filter - Change

SMCS Code: 1308; 1318-510

Selection of the Oil Change Interval

NOTICE
This machine is equipped with an engine that meets EPA Tier III, Euro Stage II, or MOC Step 2 emission regulations. A 500 hour engine oil change interval is available, provided that operating conditions and recommended multigrade oil types are met. When these requirements are not met, shorten the oil change interval to 250 hours, or use an S·O·S oil sampling and analysis program to determine an acceptable oil change interval.

If you select an interval for oil and filter change that is too long, you may damage the engine.

CAT oil filters are recommended.

Abnormally harsh operating cycles or harsh environments can shorten the service life of the engine oil. Arctic temperatures, corrosive environments, or extremely dusty conditions may require a reduction in engine oil change intervals from the recommendations in Table 21. Also refer to Manual, SEBU5898, “Cold Weather Recommendations for all Caterpillar Machines”. Poor maintenance of air filters or of fuel filters requires reduced oil change intervals. See your Caterpillar dealer for more information if this product will experience abnormally harsh operating cycles or harsh environments.

Table 21

D8T Series Engine Oil Change Interval(1)				
Multigrade Oil Type	Operating Conditions			
	Normal(2)	High Load Factor(3)|	Severe	
			Fuel Sulfur from 0.3% to 0.5%	Altitude above 1830 m (6000 ft)
Cat DEO Preferred	500 hr	500 hr	500 hr	250 hr(5)
ECF-1 10.0 minimum TBN(3) Preferred	500 hr	500 hr	500 hr	250 hr(5)
ECF-1 TBN(4) below 10.0	500 hr	500 hr	250 hr(4)	250 hr(5)
API CG-4	500 hr	250 hr(4)	250 hr(4)	250 hr(5)

(1) The standard oil change interval for the D8T is every 500 hours. If the operating conditions, fuel rates, and recommended oil types for your engine are listed in the table21 are met. The traditional oil change interval for engines is 250 hours. The standard oil change interval in this machine is 500 hours, if the operating conditions and recommended oil types that are listed in this table are met. Improvements in the engine allow this engine oil change interval. This new standard interval is not permitted for other machines. Refer to the applicable Operation and Maintenance Manuals for the other machines.

(2) Normal conditions include these factors: Fuel sulfur below 0.5%, altitude below 1830 m (6000 ft), and good air filter and fuel filter maintenance. Normal conditions do not include high load factor, harsh operating cycles, or harsh environments.

(3) Load factors are defined as a function of fuel consumption rate. High load factors can shorten the service life of your engine oil. Continuous heavy load cycles and very little idle time result in increased fuel consumption and oil contamination. These factors deplete the oil additives more rapidly. If the average fuel consumption of your D8T exceeds 51 L (13.5 US gal) per hour, follow the “High Load Factor” recommendations in Table 21. To determine average fuel consumption, measure average fuel consumption for a period of 50 to 100 hours. If the application of the machine is changed, the average fuel consumption may change.

(4) In order to verify an oil change interval of 500 hours, refer to “Program A” below.

(5) Use “Program B” below to determine an appropriate interval.

Adjustment of the Oil Change Interval

Note: Your Caterpillar dealer has additional information on these programs.

Program A

Verification for an Oil Change Interval of 500 Hours

This program consists of three oil change intervals of 500 hours. Oil sampling and analysis is done at 250 hours and 500 hours for each of the three intervals for a total of six oil samples. The analysis includes oil viscosity and infrared (IR) analysis of the oil. If all of the results are satisfactory, the 500 hour oil change interval is acceptable for the machine in that application. Repeat Program A if you change the application of the machine.

If a sample does not pass the oil analysis, take one of these actions:

- Shorten the oil change interval to 250 hours.
- Proceed to Program B.
- Change to a preferred oil type in Table 21.

Program B

Optimizing Oil Change Intervals

Begin with a 250 hour oil change interval. The oil change intervals are adjusted by increments. Each interval is adjusted an additional 50 hours. Periodic oil sampling and analysis is done during each interval. The analysis includes oil viscosity and infrared (IR) analysis of the oil. Repeat Program B if you change the application of the machine.

If an oil sample does not pass the analysis, shorten the oil change interval, or change to a preferred multigrade oil type in the listing above.

References

Reference: Form, PEDP7035, “Optimizing Oil Change Intervals”

Reference: Form, PEDP7036, “S·O·S Fluid Analysis”

Reference: Form, PEHP7076, “Understanding the S·O·S Oil Analysis Tests”

Procedure for Changing the Engine Oil and Filter

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Open the engine access door on the left side of the machine.

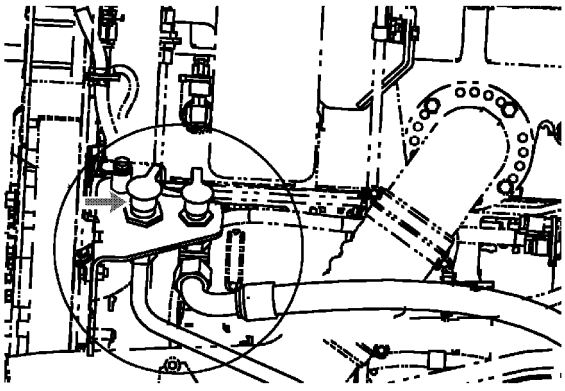


Illustration 238 g01025579

If the machine is equipped with a high speed oil change, use a 126-7539 Nozzle.

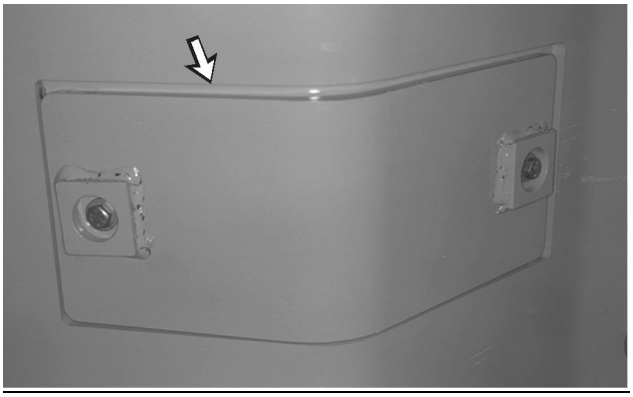


Illustration 239 g00490801

1. Remove two bolts in order to remove the crankcase drain access cover, which is in the crankcase guard.

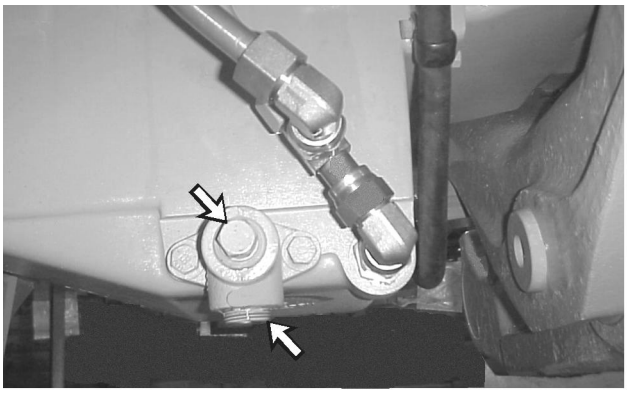


Illustration 240 g00670611

2. Remove the 4P-0520 Plug Adapter from the drain valve, if equipped.

3. Install a 25.4 mm (1.00 inch) pipe into the drain valve. The pipe requires a 1-11 1/2 NPTF pipe thread.

4. Open the drain valve. Allow the oil to drain into a suitable container. A drain hose may be attached to the pipe to aid in draining.

5. When the oil has completed draining from the crankcase, close the drain valve. Remove the pipe. Install the 4P-0520 Plug Adapter. Install the access cover.

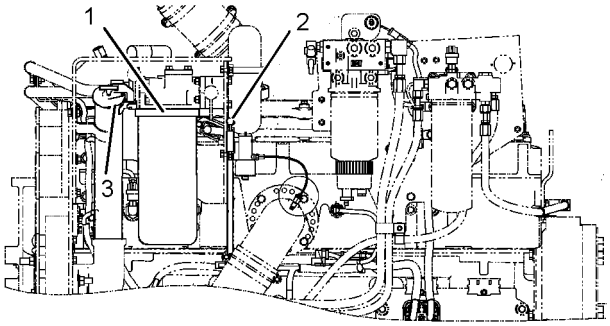


Illustration 241 g01025590

6. Remove engine oil filter element (1) and discard the engine oil filter element properly. Make sure that all of the old filter seal is removed from the filter base.

7. Apply a thin coat of oil to the seal on the new filter.

8. Install the new engine oil filter element by hand. Instructions for the installation of the filters are printed on the side of each Caterpillar spin-on filter. For non-Caterpillar filters, refer to the installation instructions that are provided by the supplier of the filter.

9. Remove oil filler cap (3). Fill the crankcase with new oil. See the topic Operation and Maintenance Manual, “Capacities (Refill)” in this manual. Clean oil filler cap (3) and install the oil filler cap.

10. To ensure that the correct amount of oil was added, always measure the oil level with the dipstick (2).

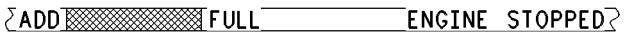


Illustration 242 g00489188

11. Check the “ENGINE STOPPED” side of the dipstick while the engine is stopped. The oil should be cold. Maintain the oil level between the “LOW” mark and the “FULL” mark. This method should be used as reference only, before the engine is started.

Illustration 243 g00489186

12. Check the “LOW IDLE” side of the dipstick while the engine is running. The oil should be at operating temperature. Maintain the oil level between the “ADD” mark and the “FULL” mark. This is the only accurate way to check the oil level.

13. Install the access cover for the crankcase drain.

For additional information about oil types, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i02763245

Engine Valve Lash - Check/Adjust

SMCS Code: 1102-025; 1102

WARNING

To prevent possible injury, do not use the starter motor to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring valve clearance.

WARNING

Electrical shock hazard. The electronic unit injector system uses 90-120 volts.

NOTICE
Operation of Caterpillar engines with improper valve adjustments will reduce engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

NOTICE
Measure the valve clearance with the engine stopped. To obtain an accurate measurement, allow at least 20 minutes for the valves to cool to engine cylinder head and engine block temperature.

Check the valve bridge before setting the valve lash. Ensure that the valve bridge is seated equally on both valve stems.

Refer to your machine's Service Manual or your Caterpillar dealer for the complete valve adjustment procedure.

i02763340

Engine Valve Rotators - Inspect

SMCS Code: 1109-040

WARNING

When inspecting the valve rotators, protective glasses or face shield and protective clothing must be worn, to prevent being burned by hot oil or spray.

WARNING

Electrical shock hazard. The electronic unit injector system uses 90-120 volts.

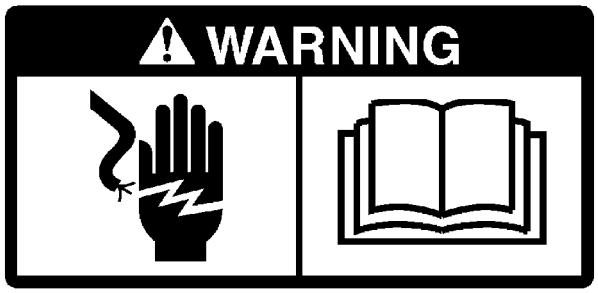


Illustration 244 g00941949

1. Start the engine. Run the engine at low idle.

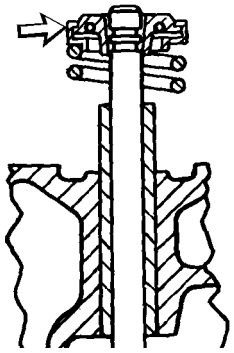


Illustration 245 g00038585

2. Watch the top surface of each valve rotator. Whenever an inlet valve closes or an exhaust valve closes, each valve rotator should turn.

3. If a valve rotator fails to rotate, consult your Caterpillar dealer for service.

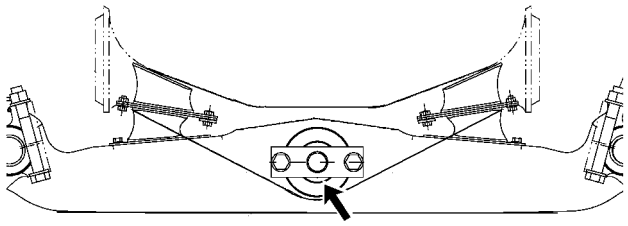
Note: Caterpillar recommends replacing valve rotators that are operating improperly. An improperly operating valve rotator will shorten valve life because of accelerated wear on the valves.

Note: If a damaged valve rotator is not replaced, some valve face guttering could result. Metal particles from the valve could fall into the cylinder. This could cause damage to the piston head and to the cylinder head.

i02092065

Equalizer Bar Center Pin - Measure

SMCS Code: 7206-040-PN; 7206-082; 7207-086-PN



g01066674

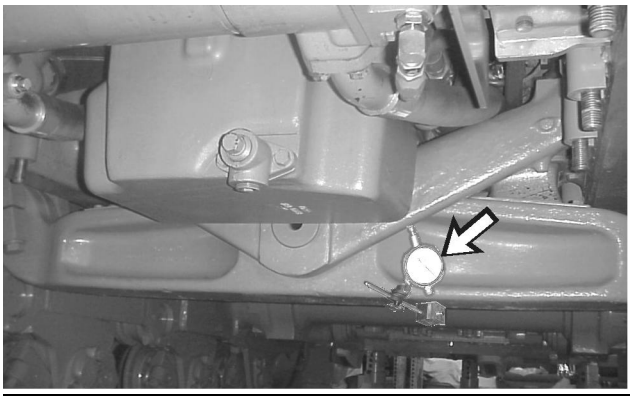
Illustration 246

Rear view

To check the equalizer bar center pin for looseness and for unusual wear, perform the following steps.

Note: All the weight of the machine must be removed from the equalizer bar. Equalizer bar must have free movement in order to be measured.

1. Clean the areas that are around the center pin with a high pressure wash.



g00736127

Illustration 247

Front view

2. Install a dial indicator and measure the vertical play in the center pin joint.

Note: Schedule the center pin joint for repair if movement exceeds 2.54 mm (.100 inch).

Consult your Caterpillar dealer for an inspection and for repair instructions.

i02777398

Equalizer Bar End Pins Oil Level - Check

SMCS Code: 7206-535

NOTICE

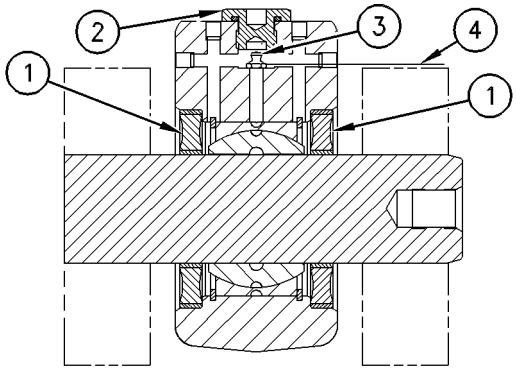
Apply gear oil through the fittings with a hand operated lubrication pump or a suitable grease gun. Use of pressure operated lubricating equipment damages the seals.

NOTICE

Before and after the equalizer bar end pin is filled with gear oil, seal (1) must be flush with the equalizer bar. If the seals are not flush, damage to the seals can result by overfilling.

g00586840

Illustration 248



g00586858

Illustration 249

1. Clean the areas that are around the end pin with a high pressure wash. Inspect the condition of the seal (1).

2. Check the area for oil leakage. Be sure that the seal is in a neutral position.

3. Remove plug (2).

4. Check the oil level. Oil level (4) should be at the top of the hex head on the fitting.

5. If the oil level is low, apply the gear oil through fitting (3) until the gear oil reaches oil level (4) at the top of the hex head on the fitting. Remove any excess oil. This will maintain a volume of air. The gear oil must be applied with a 7H-1680 Lubrication Pump or a suitable grease gun. Use the recommended gear oils that are listed in the table for “Lubricant Viscosities for Ambient Temperatures” in this manual.

6. Be sure that seals (1) are not pushed out. Push back the seals if the seals are pushed out.

7. Install plug (2).

Note: MPGM GREASE IS ALLOWED ONLY FOR A FAILED SEAL. THE SEAL SHOULD BE REPLACED AS SOON AS POSSIBLE. THE COMBINATION OF GEAR OIL AND MPGM IS NOT HARMFUL TO THE MACHINE.

When you operate the machine in arctic conditions, lubricate the equalizer bar with EMGARD EP 75W90 gear lubricant. EMGARD EP 75W90 gear lubricant is a synthetic lubricant. This lubricant is available from Hudson Corporation.

See Operation and Maintenance Manual, “Lubricant Viscosities ” for more information.

i02093902

Equalizer Bar End Pins - Measure

SMCS Code: 7206-082

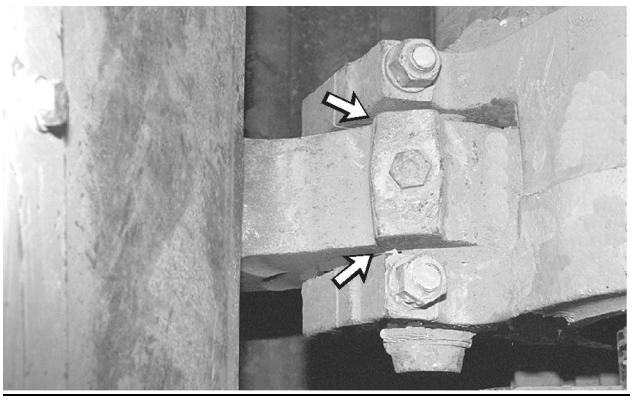


Illustration 250 g00517058

To check the equalizer bar end pin for movement and unusual wear, perform the following steps.

Note: All weight of the machine must be removed from the equalizer bar. Equalizer bar must have free movement in order to be measured.

1. Clean the areas that are around the end pin with a high pressure wash. Inspect the condition of the seal.

2. Check the area for oil leakage and a neutral seal position.

3. Install a dial indicator and measure the vertical play at both end pin joints.

4. Check the oil in both end pin joints.

Note: Schedule the end pin joint for repair if movement exceeds 1.50 mm (.059 inch).

Consult your Caterpillar dealer for an inspection and for repair instructions.

i01959542

Ether Starting Aid Cylinder - Replace

SMCS Code: 1456-510-CD

⚠ WARNING

Breathing ether vapors or repeated contact of ether with skin can cause personal injury. Personal injury may occur from failure to adhere to the following procedures.

Use ether only in well ventilated areas.

Do not smoke while changing ether cylinders.

Use ether with care to avoid fires.

Do not store replacement ether cylinders in living areas or in the operator's compartment.

Do not store ether cylinders in direct sunlight or at temperatures above 49 °C (120 °F).

Discard cylinders in a safe place. Do not puncture or burn cylinders.

Keep ether cylinders out of the reach of unauthorized personnel.

To avoid possible injury, be sure the brakes are applied and all controls are in Hold or Neutral when starting the engine.

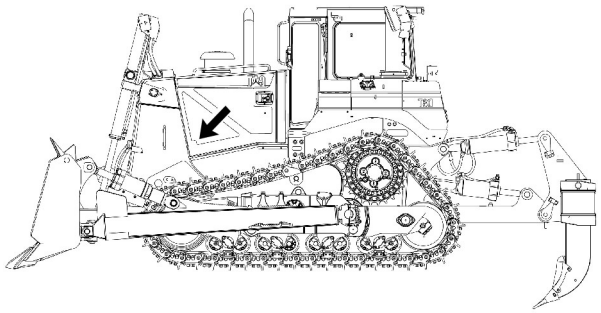


Illustration 251 g01018416

1. Open the engine access door (if equipped) on the left side of the machine. The ether canister is mounted inside the compartment on the side of the engine.

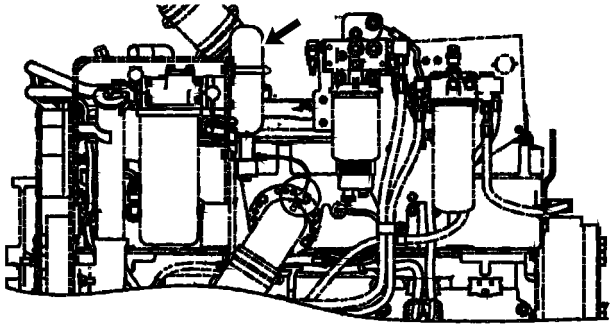


Illustration 252 g01018418

2. Loosen the retaining clamp. Remove the old canister by turning the canister counterclockwise.
3. Remove the old gasket. Install the new gasket.
4. Install the new canister. Turn the canister clockwise. Hand tighten the canister. Tighten the clamp around the canister.
5. Close the engine access door (if equipped).

i01959689

Final Drive Oil - Change

SMCS Code: 4050-044-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

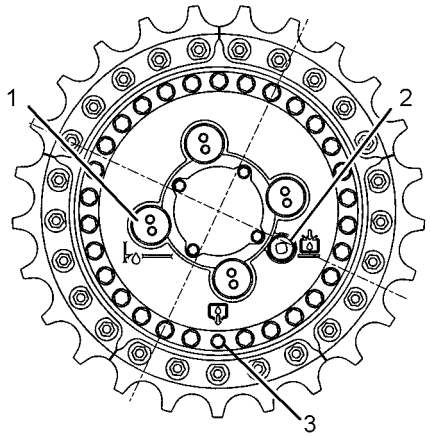


Illustration 253 g01018450

1. Position one final drive so that oil level mark (1) is horizontal. The drain plug (3) will point downward.
2. Remove oil filler plug (2).
3. Remove drain plug (3). Allow the oil to drain into a suitable container.

4. Inspect the drain plug seal. Replace the drain plug seal if the drain plug seal is damaged.

5. Clean the drain plug and install the drain plug.

6. Fill the final drive with oil to the bottom of the filler plug opening. See Operation and Maintenance Manual, “Capacities Refill”.

7. Inspect the condition of the seal of the filler plug. Replace the plug seal if the plug seal is damaged. Wipe the magnet in order to clean the plug. Install the plug.

8. Repeat Step 1 to Step 7 in order to change the oil in the other final drive.

For additional information about final drive oil, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01959718

Final Drive Oil Level - Check

SMCS Code: 4050-535-FLV

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

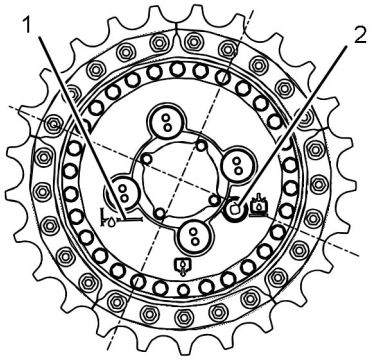


Illustration 254 g01018451

1. Position one final drive so that oil level mark (1) is horizontal with the oil filler plug (2).

2. Remove oil filler plug (2).

3. The oil level should be at the bottom of the filler plug opening. Add oil, if necessary.

4. Wipe the magnet in order to clean the plug.

5. Install oil filler plug (2).

6. Repeat Step 1 to Step 5 in order to check the oil level in the other final drive.

i02229659

Final Drive Oil Sample - Obtain

SMCS Code: 3258-008; 4011-008; 4050-008; 4050-SM; 4070-008; 4070-554-SM; 7542-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of final drive oil as close as possible to the recommended sampling interval. The recommended sampling interval is every 500 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

If the machine is operated under a high load and/or under high temperature conditions, sample all fluids at the 250 hour interval.

1. Run the machine until operating temperature has been reached. The sample must be at operating temperature in order to take an accurate sample.

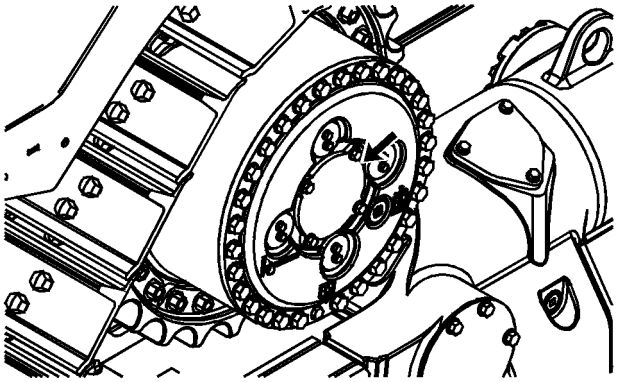


Illustration 255 g01117789

2. Remove the cover plate.

3. Obtain an oil sample. The use of a sampling gun that is inserted into the sump is the preferred method for obtaining a sample.

Note: Do not use the drain stream method to obtain a sample of the final drive oil. A stream of dirty oil from the bottom of the compartment will contaminate the sample. Likewise, never dip an oil sample from an oil container or pour a sample from a used filter.

4. Install the cover plate.

Reference: Refer to, “Lubricant Viscosities” in the Maintenance Section of this manual for the correct fluid for your machine.

Reference: Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the final drive oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the final drive oil.

i02774981

Final Drive Seal Guard Packing - Replace (If Equipped)

SMCS Code: 4052-510

The design of the seal guard has a packing that prevents debris from entering the area of the Duo-Cone Seal Gp. The close fit and tolerances limit the size of the debris that can enter the labyrinth seal to 2 mm (0.079 inch). The labyrinth seal changes the direction of the debris four times. Contact may be made at the packing after the fourth time. The packing material is impregnated with silicone oil. Therefore, it is not necessary to fill the cavity for the packing with grease. The packing is held in place by retainers that can be removed. This allows the replacement of the packing without removing the final drive. The packing has a split that allows the packing to be placed over the spindle.

Replacement of the Packing

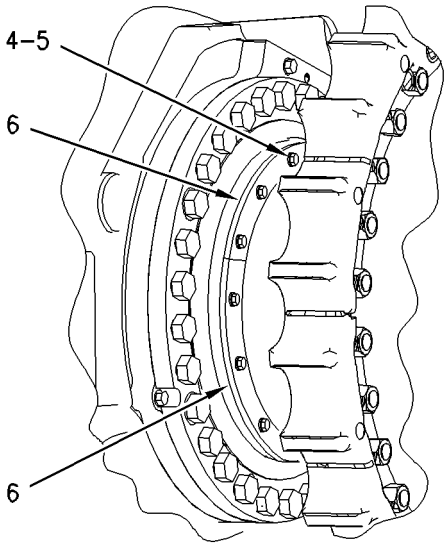


Illustration 256 g00939700

(4) Bolt
(5) Washer
(6) Retainer

1. Remove bolts (4) and washers (5). Remove retainers (6).

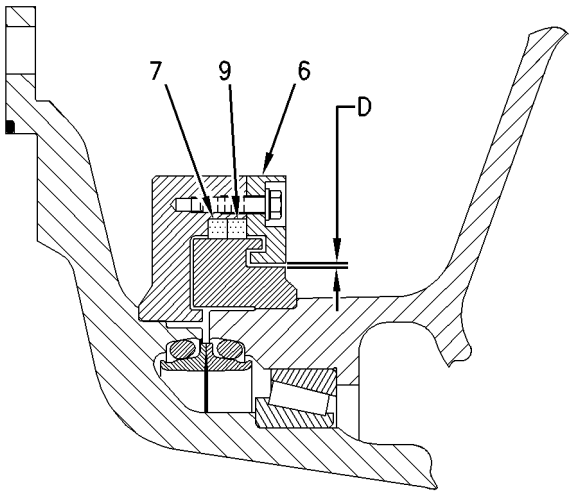


Illustration 257 g00939529

Cross section view of seal guard

(6) Retainer
(7) Inner packing
(9) Outer packing
(D) 2 mm (0.079 inch)

2. Inspect the packing and the seal guard for evidence of leaking through the packing. Remove packing (6) and (9) from seal guard (3). **Oil leakage through the packing would indicate leakage of the Duo-Cone Seal Gp in the final drive. Inspect the Final Drive for oil leakage through the Duo-Cone Seal Gp. If oil is leaking through the seal, replace the Duo-Cone Seal Gp. Refer to the Service Manual.**

Table 22

Required Parts		
Part Number	**Qty**	**Description**
137-9810	2	Seal (packing)
129-1928	1	Grease

Note: Each final drive seal guard requires two 137-9810 Seals (packing). The sections of packing are installed on top of each other in the groove of the seal guard.

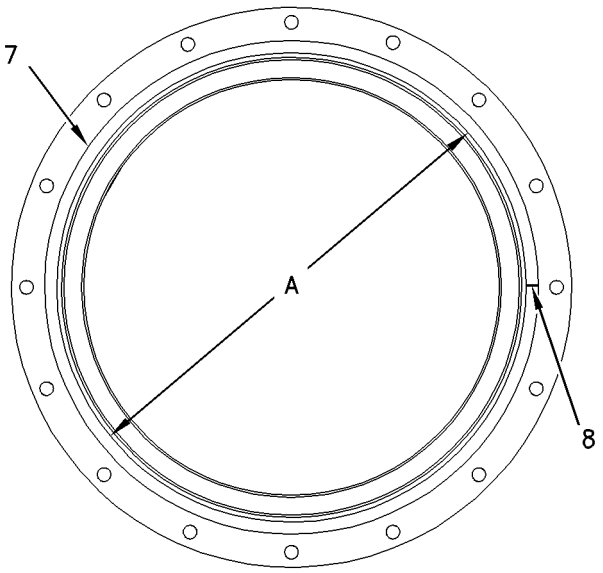


Illustration 258 g00941695

(7) Inner packing
(8) Joint in the inner packing
(A) Diameter (A)

3. Install inner packing (7). Place a thin film of 129-1928 Grease on diameter (A). Stretch the packing during installation. Smooth the packing and keep the packing uniform. Minimize the joint (8) at the ends of the inner packing (7).

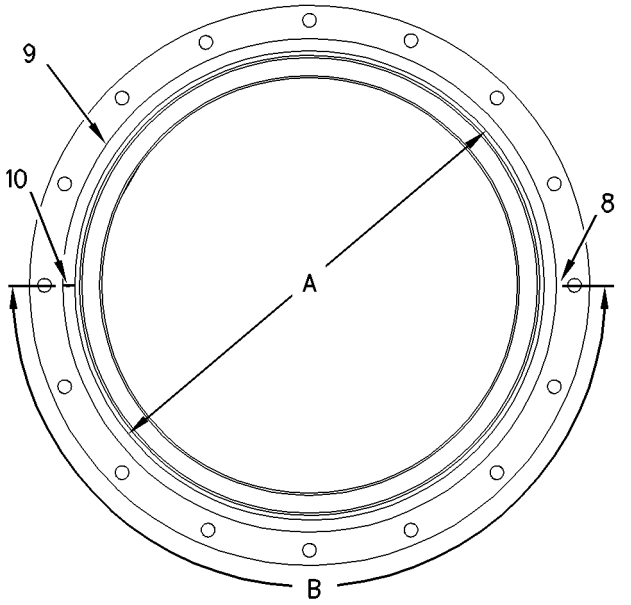


Illustration 259 g00940433

(9) Outer packing
(10) Joint in the outer packing
(A) Diameter (A)
(B) 180 degrees

4. Install the outer packing (9). **Offset the joint in the inner packing (8) and the outer packing (10) at 180 degrees.** Stretch the packing during installation. Smooth the packing and keep the packing uniform. Minimize the joint (10) at the ends of the outer packing (9).

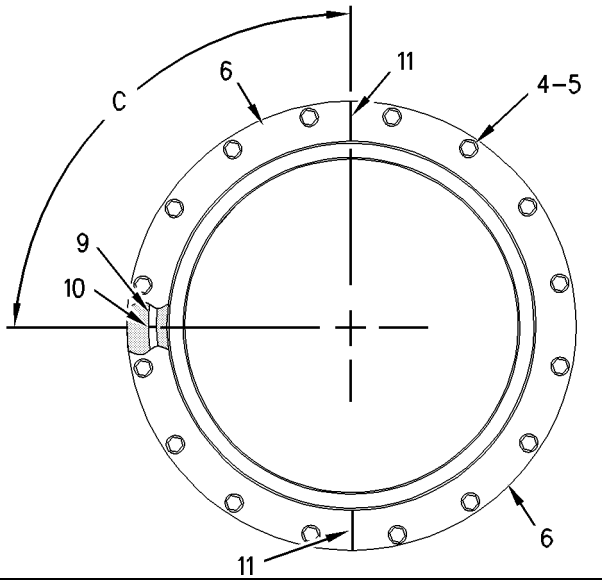


Illustration 260 g00939660

(4) Bolt
(5) Washer
(6) Retainer
(9) Outer packing
(10) Joint in outer packing
(11) Joint in retainers
(C) 90 Degrees from joint in outer packing to joint in retainers

Note: The joint (10) in the outer packing (9) must be offset 90 degrees (C) to the joints (11) in the retainers (6).

5. Assemble retainers (6) to seal guard (3) with washers (4) and bolts (5). The clearance at area (D) should be 2 mm (0.079 inch).

6. Repeat steps 3 through 5 in order to replace the packing on the other final drive, if necessary.

i02877617

Front Idler Position - Check

SMCS Code: 4159

SystemOne Undercarriage

The following check is for Caterpillar SystemOne Undercarriages that have the center tread idler.

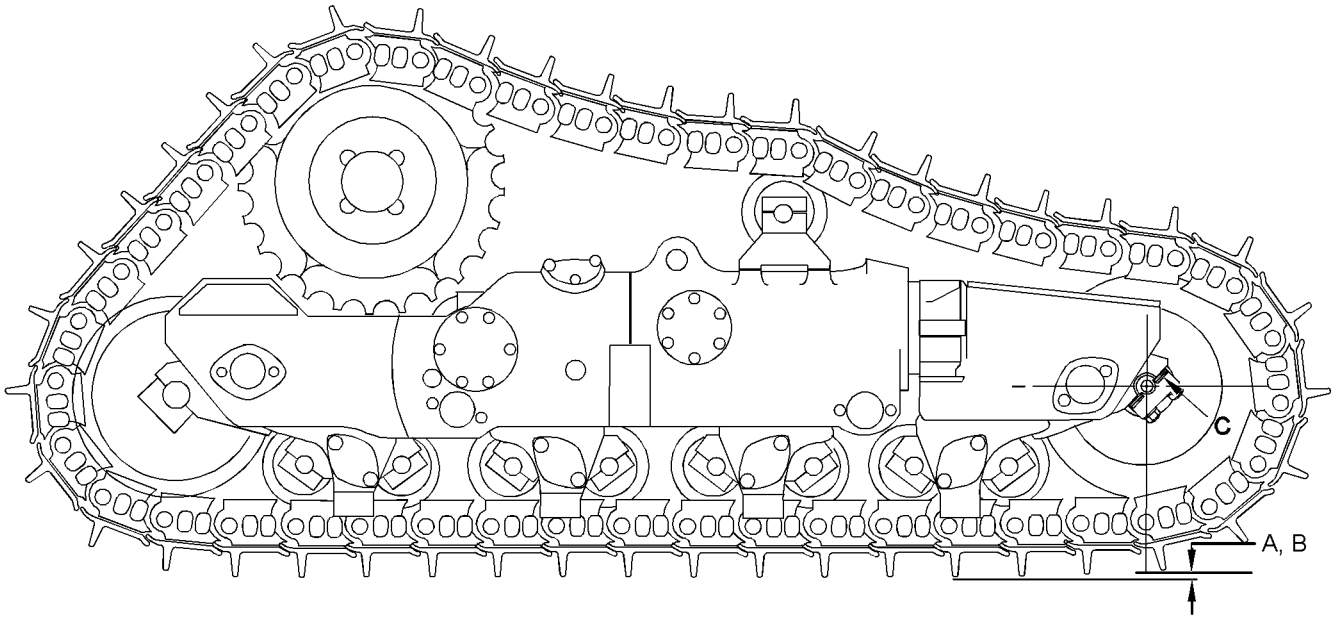


Illustration 261 g01731574

1. Park the machine on a hard, flat surface. Make sure that the bottom track is tight and that the measured grouser lies directly below the track idler shaft.

2. Measure the height (A, B) from the flat ground surface to the grouser tip that is centered below the track idler shaft.

3. Maintain the grouser height (rise) to the following dimensions.

   a. (A) Front Idlers

   Minimum – 0 mm (0 inch)

   Maximum – 45 mm (1.77 inch)

   b. (B) Rear Idlers

   Minimum – 10 mm (0.4 inch)

   Maximum – 60 mm (2.36 inch)

4. Repeat Steps 1 through 3 in order to determine the proper height dimension under each idler.

5. If excess vibration occurs after the undercarriage wear on the link and roller system exceeds 100 percent for machines with the SystemOne Undercarriage, add shims under the bogie pads in order to lower the rollers and raise the idlers, as needed.

Consult your Caterpillar dealer for detailed information about adjustments to the center tread idler.

See Operation and Maintenance Manual, “Track - Check/Adjust” for information on needed track adjustments.

Reference: See Operation and Maintenance Manual, “Reference Material” for publications and Special Instructions on removal and installation of SystemOne Track, as needed.

Center Tread Idler or Conventional Design

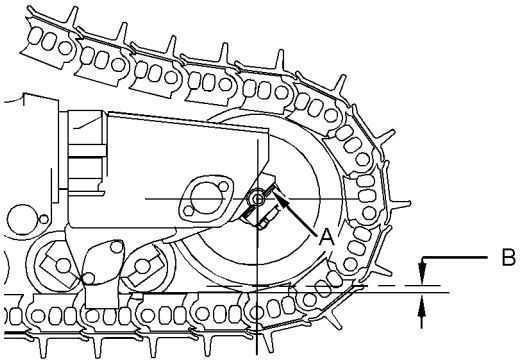


Illustration 262 g01731594

(A) Adjusting shims
(B) Dimension between the height of the front idler tread and the height of the roller tread

The following check is for undercarriage systems with either design of idler.

The height of the front idler tread should always be higher than the height of the roller tread. The dimension (B) is set approximately to 25 mm (1 inch) to 37 mm (1.5 inch) at the factory. Dimension (B) decreases as the undercarriage wears. If a rebuilt idler or a new idler is installed with track rollers that are worn, dimension (B) decreases.

Adjustment of the front idler to the correct height can improve the ride of the tractor and the performance of the dozer. Use the following procedures to determine the best operating position.

If the machine is operated on FIRM UNDERFOOT conditions and excess vibration occurs, shims can be added under the bogie pads in order to raise the front idler. Also, the adding of shims under the bogie pads lower the rollers.

If the machine is operated in SOFT UNDERFOOT conditions, shims can be removed under the bogie pads in order to raise the rollers. Also, the removal of shims under the bogie pads lowers the idlers. Lowering the front idler can improve dozing performance.

If ground rippling by the dozer or excess vibration occur in soft material, shims can be installed in order to raise the front idler.

Consult your Caterpillar dealer for detailed information about checking the idler and about adjustments to the idler.

i02229667

Fuel System - Prime

SMCS Code: 1250-548; 1258

If the engine does not start, air may be trapped in the fuel lines to the engine. Use the following procedure in order to purge air from the fuel lines.

Electric Fuel Priming Pump

NOTICE
Use a suitable container to catch any fuel that might spill. Clean up any spilled fuel immediately.

The electric fuel priming pump is located in the engine compartment on the left side of the machine.

1. Turn the ignition switch to the “OFF” position.

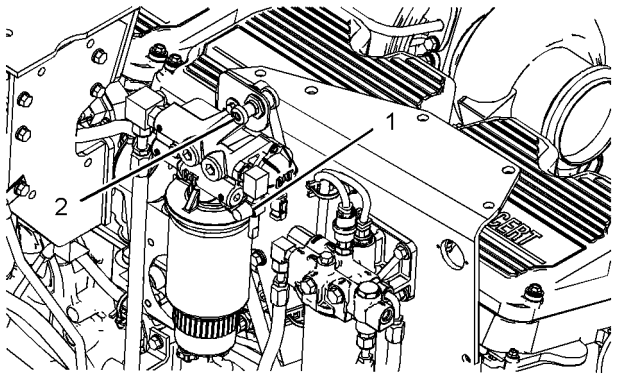


Illustration 263 g01124784

2. Twist valve (1) in order to open the air purge valve.

3. Hold the switch for the electric fuel priming pump (2) in order to be in the ON position. Allow the fuel priming pump to run until fuel without air flows through the air purge valve (1).

4. Release the switch for the fuel priming pump in order to be in the OFF position.

Note: This process will prime the fuel system regardless of the location of the air in the lines.

5. Twist valve (1) in order to close the air purge valve.

6. Hold the switch for the electric fuel priming pump (2) in order to be in the ON position for 20 seconds. This will allow the air to be completely removed from the system.

NOTICE
Do not crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

7. Start the engine. If you cannot start the engine, the engine needs more priming. If the engine continues to misfire or to smoke, more priming is necessary. Repeat step 6 if the engine will not start.

Note: The electric fuel priming pump will only operate if the engine start switch key is in the OFF position. Shut off the engine before any additional priming.

8. Run the engine at the LOW IDLE position until the engine runs smoothly.

Note: Do not activate the priming pump while you crank the engine.

Refer to Operation and Maintenance Manual, “Fuel System Secondary Filter - Replace” for information on replacing the filter.

i01969411

Fuel System Primary Filter - Clean/Replace

SMCS Code: 1260-070; 1260-510

⚠ WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Do not fill fuel filter with fuel before installing the fuel filter. Contaminated fuel causes accelerated wear to fuel system parts.

1. Turn the red lever (1) in order to shut off fuel supply.

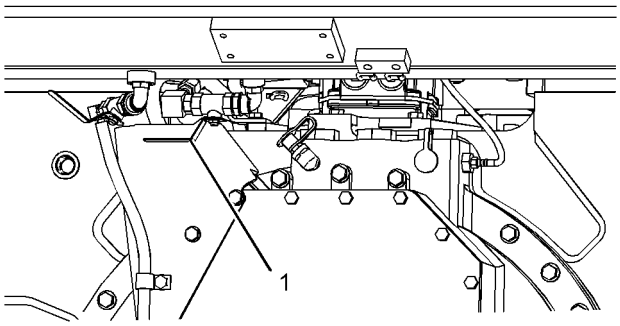


Illustration 264 g01113804

2. Open the engine access door on the left side of the machine.

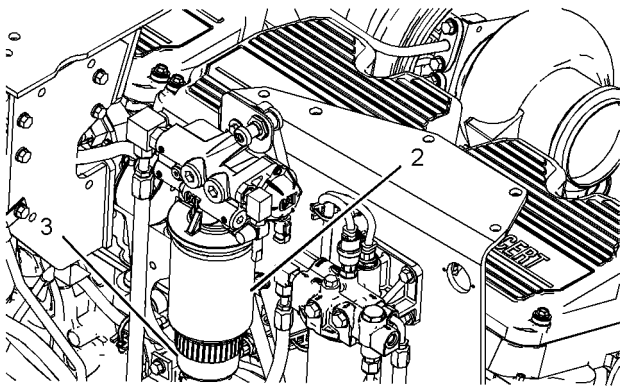


Illustration 265 g01022363

3. Drain water separator bowl (3) into a suitable container and remove the bowl from the bottom of the filter element. Clean the water separator bowl and inspect the seal. If the seal is worn or damaged, install a new seal.

4. Remove filter element (2). Properly discard the filter element.

5. Clean the filter base. Be sure that all of the old seal is removed.

6. Coat the seal of the new filter element with clean diesel fuel.

7. Install the new filter element hand tight until the seal of the filter contacts the base. Note the position of the index marks on the filter in relation to a fixed point on the filter base.

Note: There are rotation index marks on the filter that are spaced 90 degrees or 1/4 of a turn away from each other. When you tighten the filter, use the rotation index marks as a guide.

Note: Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide. For non-Caterpillar filters, use the instructions that are provided with the filter.

Note: You may need to use a Caterpillar strap wrench, or another suitable tool, in order to turn the filter to the amount that is required for final installation. Make sure that the installation tool does not damage the filter.

8. Coat the seal of the water separator bowl with clean diesel fuel. Install the water separator bowl to the filter element.

9. Turn the red lever (1) in order to resume the fuel supply.

10. Prime the fuel system. See the Topic “Fuel System - Prime” in this manual.

11. Start the engine and run the engine. Check filter (2) and water separator bowl (3) for leaks.

12. Close the engine access door.

i01969397

Fuel System Primary Filter (Water Separator) - Drain

SMCS Code: 1263-543

⚠ WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the start switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component.

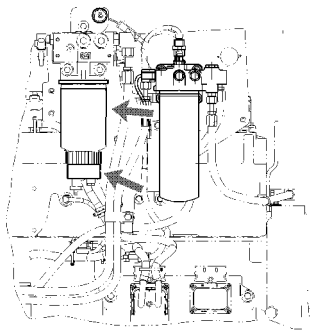


Illustration 266 g01022350

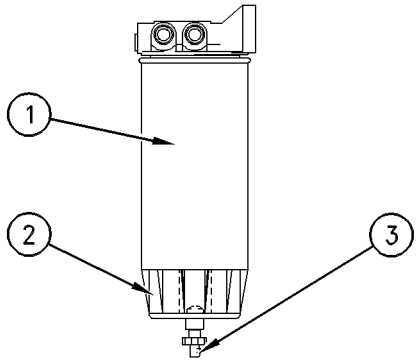


Illustration 267 g00104007

(1) Element
(2) Bowl
(3) Drain

Bowl (2) should be monitored daily for signs of water. If water is present, drain the water from the bowl.

1. Open drain (3). The drain is a self-ventilated drain. Catch the draining water in a suitable container. Dispose of the water properly.

2. Close drain (3).

NOTICE
The water separator is under suction during normal engine operation. Ensure that the drain valve is tightened securely to help prevent air from entering the fuel system.

i01969432

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510-SE

⚠ WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel system parts.

Before you replace the secondary fuel filter element, replace the primary fuel filter element. See the Topic “Fuel System Primary Filter - Replace” in this manual.

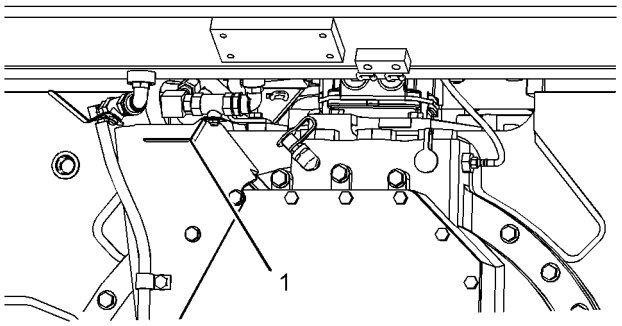


Illustration 268 g01113804

1. Turn the red lever (1) in order to shut off fuel supply.

2. Open the engine access door on the left side of the machine.

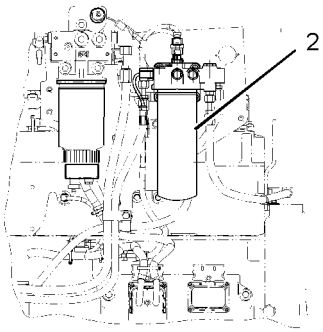


Illustration 269 g01022384

3. Remove the secondary fuel filter (2). Discard the fuel filter properly.

4. Clean the filter base. Make sure that all of the old seal is removed.

5. Install the Fuel Filter. Coat the seal of the new filter with clean diesel fuel.

6. Install the new filter by hand. When the seal contacts the base, tighten the filter according to the instructions on the filter.

   Rotation index marks are positioned on the filter at 90 degree intervals. Use these rotation index marks as a guide when you tighten the filter.

7. Turn lever (1) in order to resume fuel supply.

8. Prime the fuel system. See the Topic “Fuel System - Prime” in this manual.

9. Close the engine access door.

i01969542

Fuel Tank Cap Filter and Strainer - Replace/Clean

SMCS Code: 1273-070-STR; 1273-070-Z2

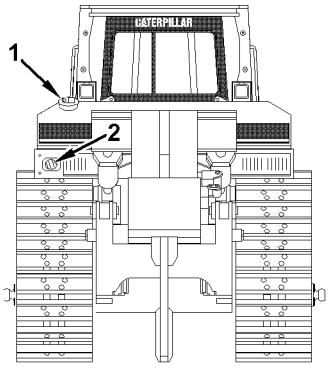


Illustration 270 g01022482

The fuel tank is located on the rear of the machine. The filler cap (1) is on the left side of the machine next to the ROPS.

Only vented fuel caps have filters. Machines without the fast fill fuel adapter require a vented fuel cap.

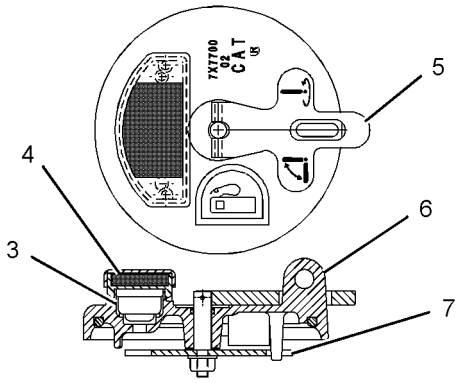


Illustration 271 g01110732

1. Lift lever (5) in order to remove the fuel tank filler cap. Turn the lever counterclockwise until the lever stops. Lift the cap straight up in order to remove the cap.

2. Remove the fuel strainer from the filler neck.

3. In order to replace the filter assembly, remove two screws that secure filter assembly (4) to the fuel cap. Remove filter assembly (4), valve (3), and the gaskets.

4. Wash the cap and the strainer in a clean, nonflammable solvent.

5. Inspect the tank cap seal. If the seal is damaged, replace the seal.

6. Replace the filter assembly, the valve, the gaskets, and the screws. Use a 9X-2205 Cap Filter Kit.

7. Install the strainer.

8. Install the fuel cap. Rotate the fuel cap clockwise until three tabs (7) drop into the slots in the adapter. Rotate lever (5) clockwise until the lever stops. Lower lever (5) over locking tab (6).

Fast Fill Fuel Adapter (If Equipped)

See illustration 270.

Machines that are equipped with a fast fill fuel adapter (2) have identical fuel caps as systems without a fast fill fuel adapter. Use the same procedure for changing the filter in the two systems.

i02770686

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

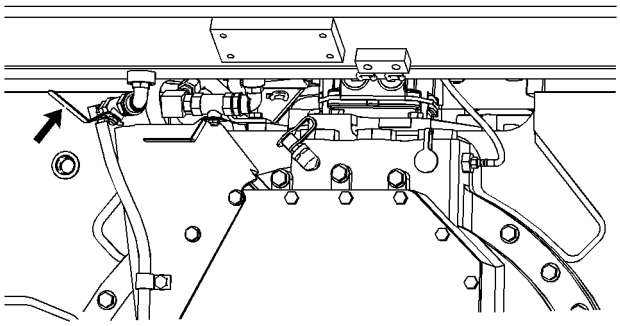


Illustration 272 g01113920

The drain valve is under the fuel tank at the rear of the machine.

1. Open the drain valve with the yellow handle. Allow the water and the sediment to drain into a suitable container.

2. Close the drain valve.

i02606338

Fuses and Circuit Breakers - Replace/Reset

SMCS Code: 1417-510; 1420-529; 1420

Fuses – Fuses protect the electrical system from damage that is caused by overloaded electrical circuits. Replace a fuse if the element separates. If the fuse of a particular electrical system requires frequent replacement, check the electrical circuit. Repair the electrical circuit, if necessary.

NOTICE
Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE
If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Caterpillar dealer.

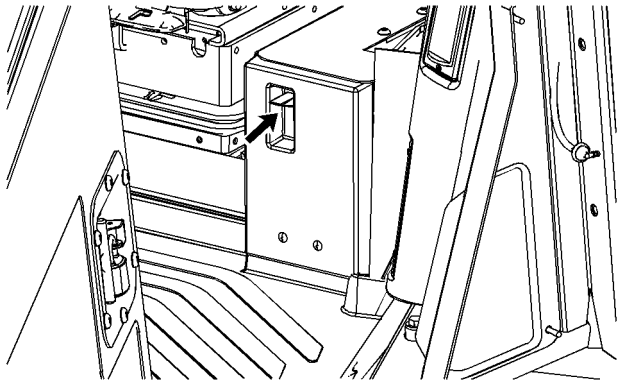
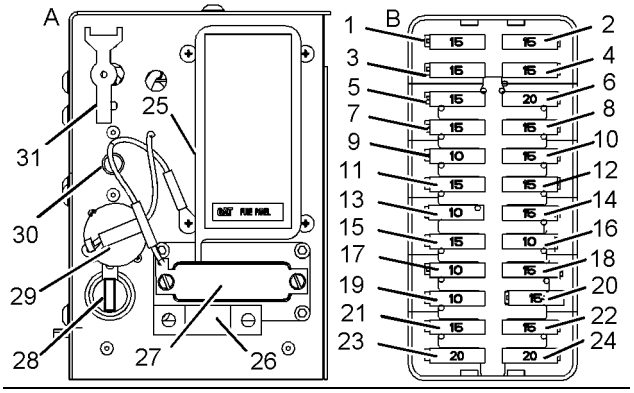


Illustration 273 g01118158

Open the cover for access to the circuit breakers and the fuses. This is inside the operator station below the left armrest above the floorplate.



g01018359

Illustration 274

(A) Open fuse box
(B) Open fuse panel

Fuse listing:

ROPS floodlights (1) – 15 Amp

Ripper floodlights (2) – 15 Amp

ECM engine monitoring (3) (Power train ECM) – 15 Amp

Rear ROPS floodlights (4) – 15 Amp

Auxiliary (5) – 10 Amp

Spare 1 (6) – 20 Amp

GPS/Radio Transmission Antenna (7) – 15 Amp

Seat, Ripper, or Implements (8) – 15 Amp

Standard Converter (9) – 10 Amp

Spare 2 (10) – 15 Amp

“AccuGrade” (11) – 15 Amp

Wipers (12) – 15 Amp

Ignition Key (13) – 10 Amp

Fender Floodlights (14) – 15 Amp

Horn (15) – 15 Amp

CAES Display (16) – 10 Amp

Secondary Brake (17) – 10 Amp

Unswitched Auxiliary (18) – 15 Amp

Product Link (19) – 10 Amp

Advisor Panel (20) – 15 Amp

Implement ECM (21) – 15 Amp

Implement ECM (22) – 15 Amp

Engine ECM (23) – 20 Amp

24 VA − 12 VA Converter (24) (Attachment) – 20 Amp

Cover (25) – Fuse panel

Fuse (26) – 175 Amp

Fuse cover (27) – Plastic

Power outlet (28) – 12 Volt

Starting/Charging Analyzer (29) (Plug) – 70-pin Connector

HVAC blower (30) (Reset button) – 15 Amp

Fuse Puller (31) – Auto Stop

i02245859

High Intensity Discharge Lamp (HID) - Replace (If Equipped)

SMCS Code: 1434-510

WARNING

HID lamps operate at very high voltages. To avoid electrical shock and personal injury, disconnect power before servicing HID lamps.

WARNING

HID bulbs become very hot during operation. Before servicing, remove power from lamp for at least five minutes to ensure lamp is cool.

NOTICE

Although HID bulb materials may change over time, HID bulbs produced at the time of the printing of this manual contain mercury. When disposing of this component, or any waste that contains mercury, please use caution and comply with any applicable laws.

1. Remove the electrical power from the high intensity discharge lamp (HID). The electrical power must be removed from the HID lamp for at least five minutes, in order to ensure that the bulb is cool.

2. Disassemble the housing for the HID lamp in order to have access to the bulb.

Note: On some HID lamps, the bulb is an integral part of the lens assembly. The bulb is not removed separately from the lens assembly. Replace the entire lens assembly on these HID lamps.

3. Remove the bulb from the HID lamp.

4. Install the replacement bulb in the HID lamp.

   If the bulb is an integral part of the lens assembly, install the replacement lens assembly in the HID lamp.

Note: In order to avoid failure to the bulb that is premature, avoid touching the bulb's surface with your bare hands. Clean any fingerprints from the bulb with alcohol prior to operation.

5. Reassemble the housing for the HID lamp. Ensure that any printing on the lens is oriented correctly with respect to the HID lamp's mounting position on the machine.

6. Reattach the electrical power to the HID lamp.

7. Check the HID lamp for proper operation.

Note: Consult your Caterpillar dealer for additional information on HID lamps.

i02054663

Horn - Test

SMCS Code: 7402-081

Test the horn on a daily basis. Press downward on the horn button in order to sound the horn. If the horn does not sound, make the necessary repairs before you operate the machine.

i03623772

Hydraulic System Filter Screens - Clean

SMCS Code: 5068

The screen should be cleaned especially when one of the following situations have occurred:

- Failure of the Implement Pump
- Failure of the Fan Pump
- Failure of the Fan Motor
- Cleaning of the Hydraulic Tank
- PCR (Engine Overhaul)

1. Park the machine on a level surface. Lower the work tool to the ground. Engage the parking brake.

2. Turn the engine start switch key to ON.

3. Move the hydraulic control levers through all of the positions in order to release pressure.

4. Turn the engine start switch key to OFF.

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Before removing the filler cap, press the valve relief button on the hydraulic tank in order to relieve the tank pressure.

Remove the filler cap only when the engine is stopped and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly in order to relieve any remaining pressure.

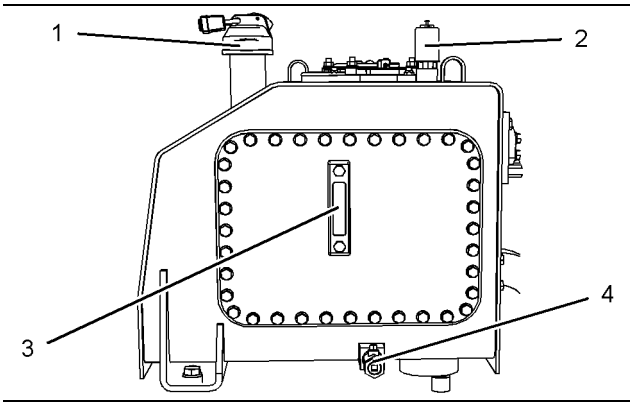


Illustration 275 g01943757

Front view of the hydraulic tank

(1) Filler Cap
(2) Relief Valve
(3) Sight Gauge
(4) Drain Plug

5. Press button (2) on the breaker relief valve in order to relieve any tank pressure. Slowly remove filler cap (1).

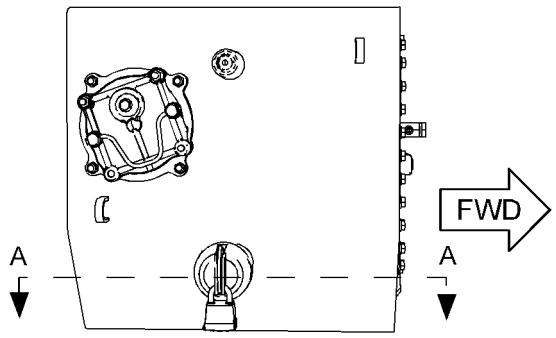


Illustration 276 g01943758

Top view of the Hydraulic Tank

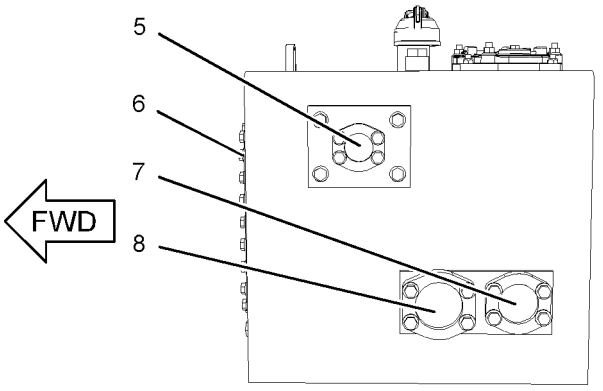


Illustration 277 g01943759

Bottom view of the Hydraulic Tank

(5) Implement return port
(6) Hydraulic tank access cover
(7) Case drain return port
(8) Suction port

6. Drain the hydraulic oil tank at drain (4).

Reference: For the correct procedure, refer to Operation and Maintenance Manual, “Hydraulic System Oil - Change”.

7. Disconnect the drain lines.

8. Unbolt hydraulic tank access cover (6).

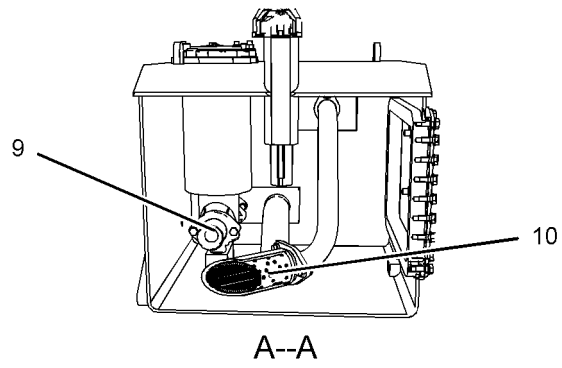


Illustration 278 g01943760

Return screens

(9) Implement return
(10) Case drain return

9. Remove return screens that are within reach. Clean the screens with a clean, nonflammable solvent.

10. Inspect the O-ring seal, if the casting is removed. If the seal is damaged, replace the seal.

11. Replace the return screens.

12. Replace hydraulic tank access cover (6).

13. Assemble the drain lines.

14. Fill the hydraulic tank.

Reference: For the correct procedure, refer to Operation and Maintenance Manual, “Hydraulic System Oil - Change”.

15. Replace filler cap (1).

i02229763

Hydraulic System Oil - Change

SMCS Code: 5050-044

WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly to relieve pressure.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Operate the machine in order to warm the oil.

Park the machine on level ground. Lower the bulldozer blade and the ripper to the ground and apply slight downward pressure. Engage the parking brake and stop the engine.

1. Make sure that all work tools are lowered to the ground.

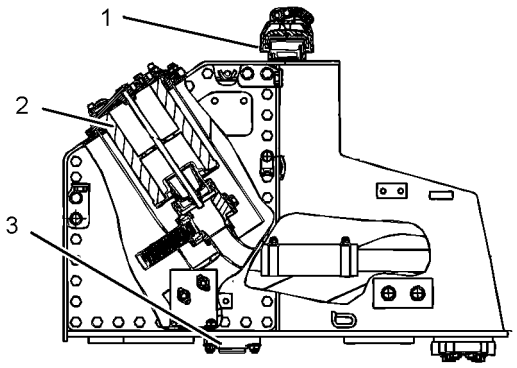


Illustration 279 g01022926
Cross section view

2. Remove hydraulic tank filler cap (1) slowly in order to relieve any pressure.

3. Wash the filler strainer and the filler cap in a clean nonflammable solvent.

4. Remove oil drain plug cover (3) that is under the hydraulic tank.

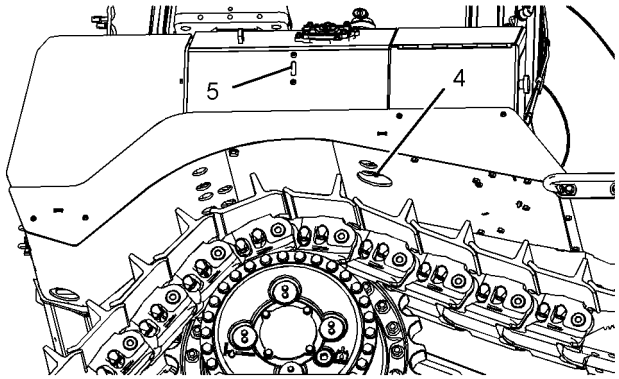


Illustration 280 g01022927
(4) Oil drain plug.
(5) Sight gauge

5. Remove the oil drain plug. The oil drain plug is located under right fender (4).

6. Attach a hose to a 126-7914 Swivel. Install the swivel and the hose into the drain plug opening. A pipe nipple 10 cm (4 inch) and a hose can also be used. Use a 25.4 mm (1 inch) pipe with 1-11 1/2 NPTF threads. Do not tighten the pipe.

7. Rotate the swivel clockwise in order to open the internal drain valve. Allow the oil to drain into a suitable container.

8. Remove the swivel. The valve for the hydraulic tank will close.

9. Clean the drain plug and install the drain plug. Tighten the drain plug to a torque of 68 ± 7 N·m (50 ± 5 lb ft). Install the oil drain plug cover.

10. Change the hydraulic system filters. Case drain filter (2) is shown. See the Operation and Maintenance Manual, “Hydraulic System Oil Filters - Replace”.

11. Install the filler strainer.

12. Fill the hydraulic oil tank. See the Operation and Maintenance Manual, “Capacities (Refill)” in order to determine the amount of hydraulic oil that is needed to fill the hydraulic oil tank.

13. Inspect the filler cap gasket. Replace the gasket if damage or wear is evident.

14. Install the filler cap.

15. Start the engine. Run the engine for a few minutes.

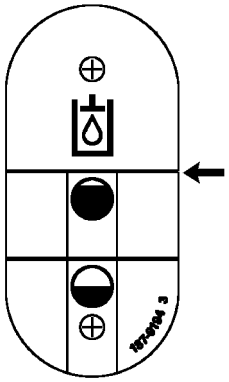


Illustration 281 g01022619

The arrow indicates the “FULL” mark.

Enlarged view of the sight gauge

16. Maintain the oil level to the “FULL” mark in the sight gauge. Check with the attachments on the ground and with cold oil. Add oil, if necessary.

17. Stop the engine.

For additional information about hydraulic system oil, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i02214240

Hydraulic System Oil Filter (Pilot) - Replace

SMCS Code: 5068-510-PS; 5068-510; 5092-510

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly in order to relieve pressure.

Pilot Hydraulic Oil Filter

1. Lower the bulldozer and the ripper to the ground. Turn off the engine.

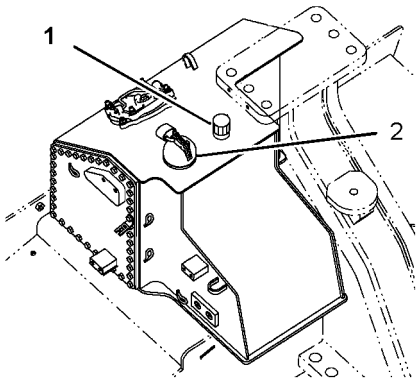


Illustration 282 g01075799

2. The hydraulic tank is located on the right side of the machine. Depress the button on breaker relief valve (1) next to the filler cap (2) in order to relieve any tank pressure. Remove the filler cap.

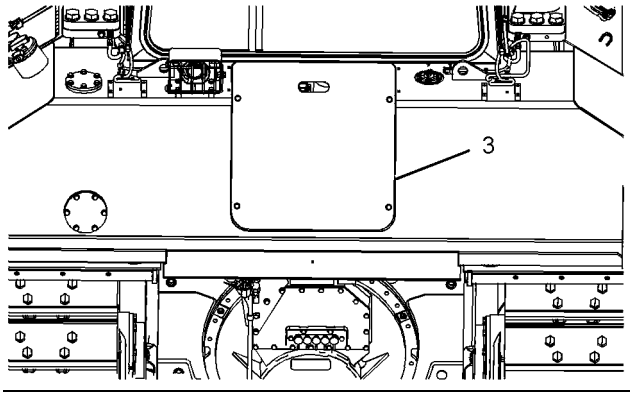


Illustration 283 g01117647

3. Remove access cover (3) at the rear of the fuel tank.

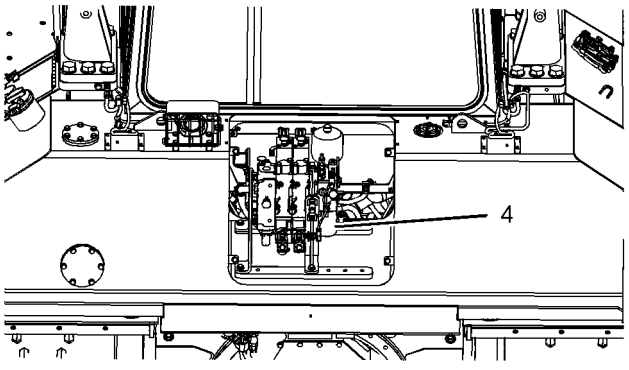


Illustration 284 g01117748

Rear view

4. Remove spin-on type filter (4) that is the pilot hydraulic oil filter. The pilot hydraulic oil filter is attached below the accumulator manifold. Properly discard the filter element.

5. Apply a thin coat of oil to seal on the new filter. Install a new pilot hydraulic oil filter hand tight until the seal of the pilot hydraulic oil filter contacts the base. Note the position of the index marks on the filter in relation to a fixed point on the filter base.

Note: There are rotation index marks on the pilot hydraulic oil filter that are spaced 90 degrees or 1/4 of a turn away from each other. When you tighten the pilot hydraulic oil filter, use the rotation index marks as a guide.

6. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide. For non-Caterpillar filters, use the instructions that are provided with the filter.

Note: You may need to use a Caterpillar strap wrench, or another suitable tool, in order to turn the filter to the amount that is required for final installation. Make sure that the installation tool does not damage the filter.

7. Install the access cover.

8. Start the engine.

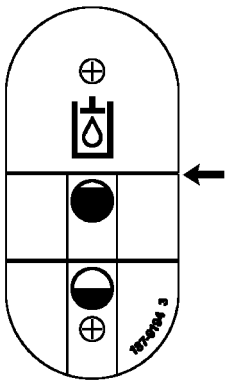


Illustration 285 g01022619

9. Maintain the hydraulic oil to the “FULL” mark in the sight gauge that is on the outside of the hydraulic tank.

10. Install hydraulic tank filler cap (2).

11. Install access cover (3).

12. Stop the engine.

For additional information about hydraulic systems, refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i02769408

Hydraulic System Oil Filters - Replace

SMCS Code: 5068-510

WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Lower the bulldozer and the ripper to the ground. Turn off the engine.

   Reference: See Operation and Maintenance Manual, “Stopping the Machine” for additional information.

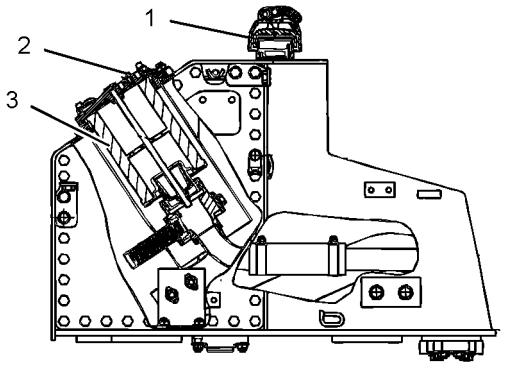


Illustration 286 g01076258

2. On the right side of the machine, remove hydraulic oil filler cap (1) in order to relieve the tank pressure. Remove the filler strainer.

3. Remove four bolts (2) in order to remove the cover from the case drain filter.

4. Remove case drain filter (3) and properly discard the case drain filter.

5. Clean the strainer, the filter housing, and the oil filler cap in a clean, nonflammable solvent.

6. Install a new case drain filter.

7. Install the strainer, the cover, and the four bolts.

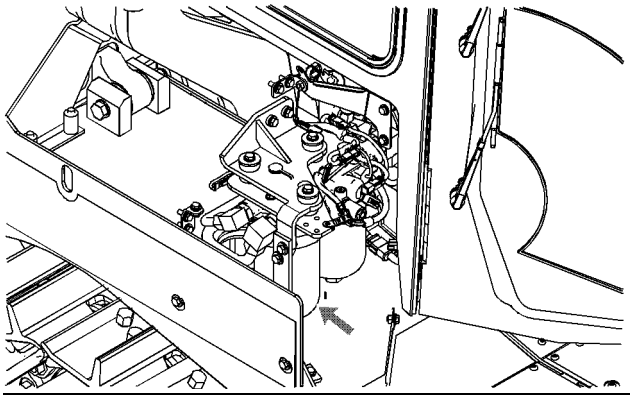


Illustration 287 g01103238

Steering charge filter

8. Change the steering charge filter.

   Reference: See “Steering Charge Filter - Change” in this manual for more information.

9. Fill the hydraulic system with new oil. See Operation and Maintenance Manual, “Capacities (Refill)”. Install hydraulic oil filler cap (1).

10. Start the engine.

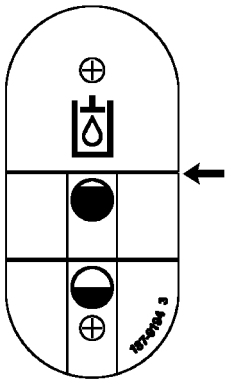


Illustration 288 g01022619

11. Maintain the oil level to the “FULL” mark in the sight gauge for the hydraulic oil tank. Check with the attachments on the ground and cold oil. Add oil, if necessary.

12. Stop the engine.

13. Close the access door.

For additional information about hydraulic system oil, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01969751

Hydraulic System Oil Level - Check

SMCS Code: 5056-535-FLV; 7479

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly in order to relieve pressure.

Lower the bulldozer and the ripper to the ground. Place the ripper shanks in the vertical position.

The hydraulic tank is on the right rear side of the machine.

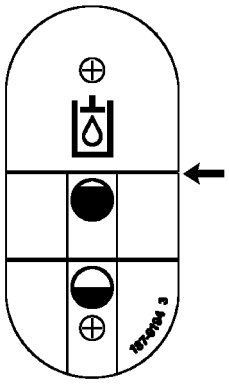


Illustration 289 g01022619

1. Maintain the oil level to the “FULL” mark in the sight gauge. Check the oil level when the oil is cold. Verify that the oil level is below the “FULL” mark before you remove the filler cap.

2. If the hydraulic system requires additional hydraulic oil, remove the filler cap slowly in order to relieve the pressure. Add oil through the filler tube.

3. Clean the filler cap and install the filler cap.

i01960922

Hydraulic System Oil Sample - Obtain

SMCS Code: 5095-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

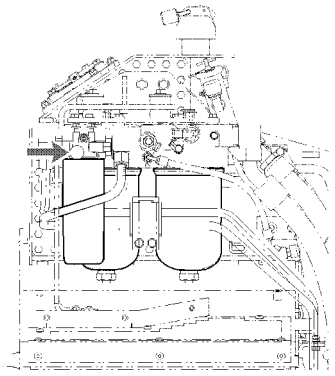


Illustration 290 g01018666

Obtain a sample of the hydraulic oil from the sampling valve. The sampling valve is located behind the access door on the right side of the cab. Remove the protective cap from the oil sampling port that is above the steering charge filter. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the oil.

For additional information about hydraulic system oil, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i02776749

Indicators and Gauges - Test

SMCS Code: 7450-081; 7490-081

⚠ WARNING

If the action alarm does not sound during this test or machine monitoring displays are not functioning, do not operate the machine until the cause has been corrected. Machine operation with faulty action alarms or displays could result in injury or death as any Warning Category 3 notifications will not be relayed to the operator.

Check the operation of the Monitoring System. Observe the self test when you start the engine.

The system performs an automatic self test when you turn the engine start switch to the ON position.

The self test verifies that the monitoring panel and the display modules are operating properly. The self testing feature verifies that the display module is properly operating.

The internal circuits, the indicators, and the gauges are automatically checked.

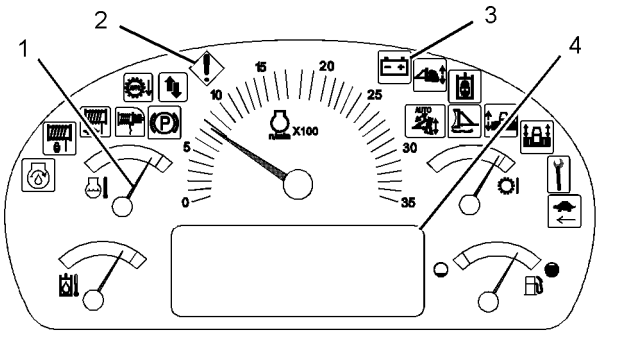


Illustration 291 g01113652

Instrument module

The operator must observe the indicators and the gauges in order to determine whether gauge module (1), action light (2), alert indicators (3), and the LCD display (4) are operating properly. The self test lasts for approximately three seconds.

During the self test, all status indicators on the instrument module light.

The digital display shows the following readouts:

- Initial part number of the instrument module
- All indicators of units (Deg C, kPa, rpm, and liters)
- “X10” readout
- Symbol for the hour meter
- “8.8.8.X.8.8” readout

The pointers in the quad gauge point upward. Then, the pointers point to the left. Then, the pointers point to the right. Then, the pointers point to the final position.

- The readout of the gear shows “**”.
- The speed readout shows “888”, “MPH”, and “km/h”.
- The rear action light “ON then OFF”
- The forward action light stays illuminated.
- The action alarm sounds once.

The monitoring panel is then in the normal operating mode.

If the above tests are not correctly completed, the system will not function in the normal operating mode. Consult your Caterpillar dealer for an electrical system check. Any repairs must be made before you start the engine.

Turn on all of the machine lights. Check for proper operation. Sound the forward horn.

Stop the engine.

Make any necessary repairs before you operate the machine.

i01959914

Lift Cylinder Yoke Bearings - Lubricate

SMCS Code: 5102-086-BD

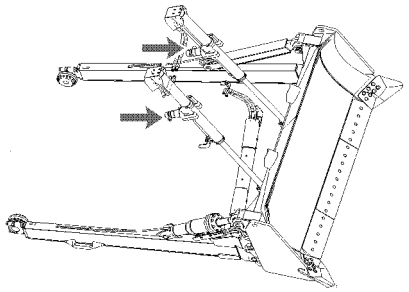


Illustration 292 g01018514

The fittings are on the left front side of the machine and on the right front side of the machine. Lubricate the bearings by applying grease to the two fittings. Use MPGM Grease.

i02106227

Oil Filter - Inspect

SMCS Code: 1318-507; 3067-507; 5068-507

Inspect a Used Filter for Debris

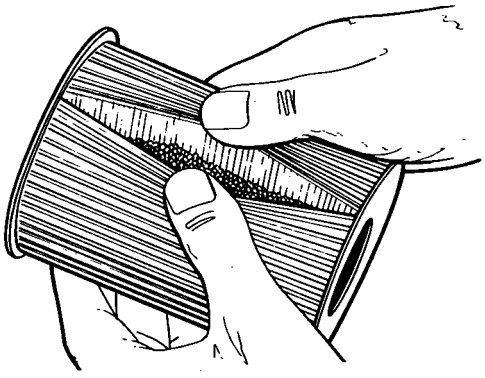


Illustration 293 g00100013

The element is shown with debris.

Use a filter cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i03079214

Pivot Shaft Oil Level - Check

SMCS Code: 4153-535-FLV

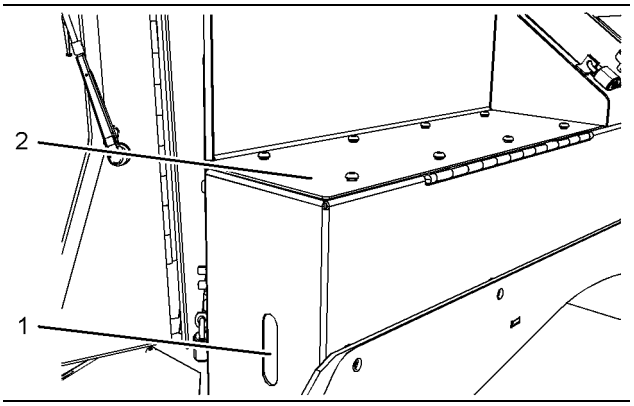


Illustration 294 g01562554

Oil must be visible through the sight gauge (1).

Open the access door (2) to the battery box on the left fender.

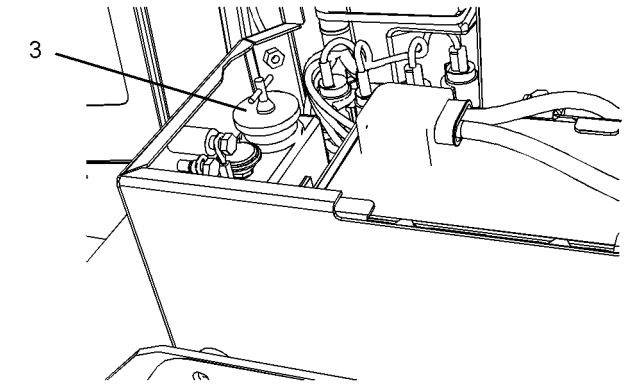


Illustration 295 g01561896

Top view

To fill the reservoir, add oil through the dipstick opening (3).

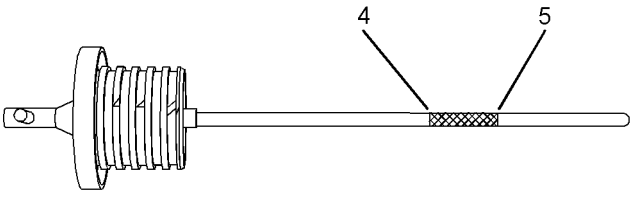


Illustration 296 g01562774

Maintain the oil within the FULL (4) and the ADD (5) limits of the dipstick for the oil reservoir. Do not overfill the oil reservoir. Hot oil can overflow the reservoir.

Note: The initial fill of the pivot shaft may trap air in the tube. The level of the oil may fall as air escapes. Barometric pressure may raise the oil level or the pressure may lower the oil level. Changes in the altitude may raise the oil level or the altitude may lower the oil level. The reservoir must be filled several times in order to remain consistently full.

Note: Do not use the Vacuum Fill method.

i03644984

Power Train Breather - Clean

SMCS Code: 3030-070-BRE

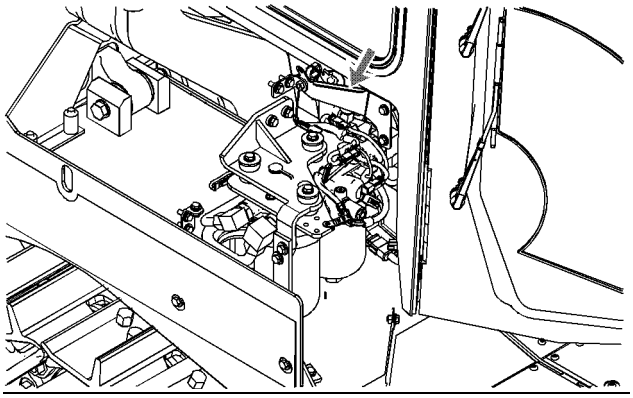


Illustration 297 g01019203

Some components are removed for clarity.

1. Open the access cover for the transmission filler tube on the right side of the cab. The breather attaches to the filler tube on top of a 90 degree elbow. Unscrew and remove the breather.
2. Clean the breather in clean, nonflammable solvent.
3. Install the breather and close the cover.

i03644986

Power Train Oil Filters - Replace

SMCS Code: 3067-510

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The transmission oil filters are located on the right side of the machine behind the access cover that faces front of the machine.

Note: The Caterpillar recommended filters are a special high efficiency design. Use only the recommended filter.

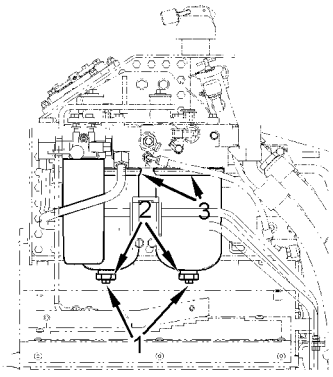


Illustration 298 g01023030

1. Open the access door above the right fender. Remove drain plugs (1) in order to remove a small amount of oil. Use a wrench in order to remove filter housings (2).
2. Remove the filter elements and properly discard the filter elements.
3. Clean the filter element housings and clean filter bases (3) with a clean cloth.
4. Inspect the seals. If the seals are damaged, replace the seals.
5. Install new filter elements. Install the filter element housing covers.
6. Start the engine.

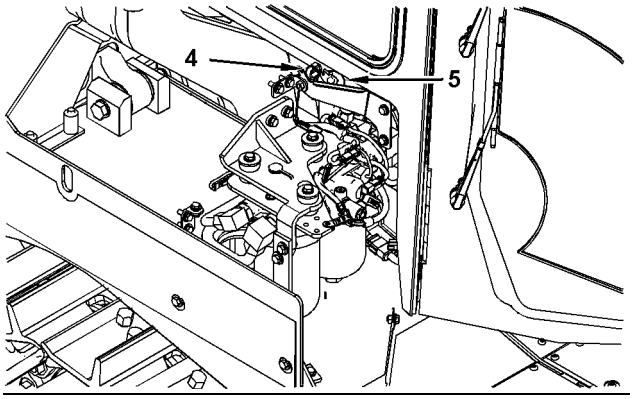


Illustration 299 g01023041

Some components are removed for clarity.

7. Check the oil.

HOT OIL:

Use the “TRANSMISSION IN NEUTRAL, ENGINE AT LOW IDLE, AND OIL AT OPERATING TEMPERATURE” side of the dipstick (4). Check when the transmission is in NEUTRAL and the engine is running at LOW IDLE. The oil should be at operating temperature. Maintain the oil level between the “OPERATING ZONE” marks. This is the only accurate way to check the oil level.

COLD OIL:

Check the “ENGINE STOPPED COLD OIL” side of the dipstick (4) while the engine is stopped. Maintain the oil between the “OPERATING ZONE” marks. This method should be used as reference only.

8. Remove filler cap (5). If necessary, add oil.

9. Clean the filler cap and install the filler cap.

10. Close the access door.

i03644989

Power Train Scavenge Screen - Clean

SMCS Code: 3030-070-MGS

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

When you change the transmission oil, clean the scavenge screen. **Drain the oil before you remove any screens.**

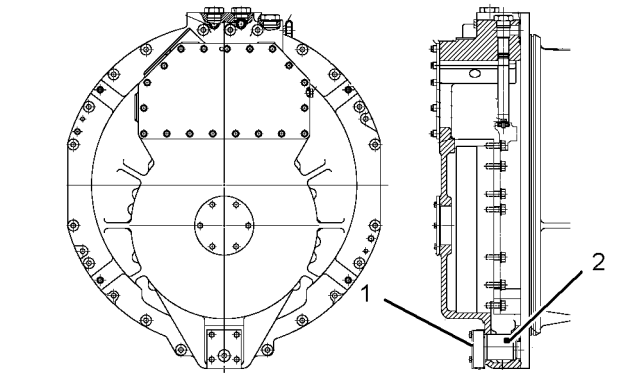


Illustration 300 g01067695

Note: Ecology drains have been provided. An ecology drain drains off the oil from the sump of the planetary transmission. Remove the bottom plug. Install a pipe with 1/2-14 NPTF threads and a rubber hose. Drain the sump by backing out the valve until the oil begins to drain.

1. Remove cover (1), the seal, and transmission scavenge screen (2) from the bottom of the transmission.

2. Wash the screen in a clean, nonflammable solvent.

3. Inspect the seal. If the seal is damaged, replace the seal.

4. Install transmission scavenge screen (2), the seal and cover (1) on the transmission.

5. Install the bottom guard.

Reference: See Operation and Maintenance Manual, “Transmission System Oil and Screens - Change/Clean” in order to fill with oil.

i03644987

Power Train System Oil And Screens - Change/Clean

SMCS Code: 3067-070; 3067-510

⚠ WARNING

At operating temperature, the hydraulic tank is hot and under pressure.

Hot oil and components can cause personal injury. Do not allow hot oil or components to contact skin.

Remove the filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand. Remove the filler cap slowly to relieve pressure.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Drain the Oil and Change the Transmission Oil Filter Elements

Operate the machine in order to warm the power train oil. The machine must be level. Lower the attachments with slight down pressure.

See the Operation and Maintenance Manual, “Transmission and Torque Converter Oil Filters - Replace” in this manual for the procedure to change the filters.

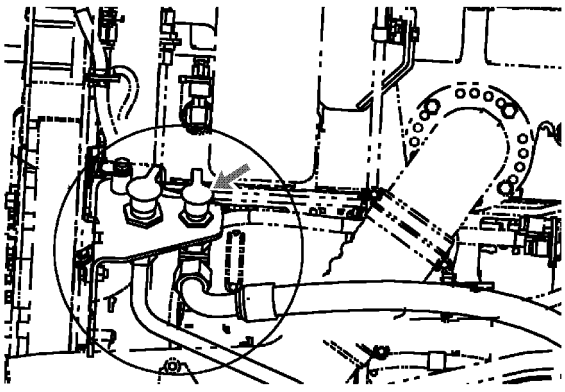


Illustration 301 g01118275

Open the left engine compartment in order to locate the high speed oil change arrangement.

Use a 126-7538 Nozzle if the machine is equipped with the high speed oil change arrangement. This arrangement removes oil from the sump in the bevel gear case. The high speed oil change does not remove oil from the torque converter or from the transmission case.

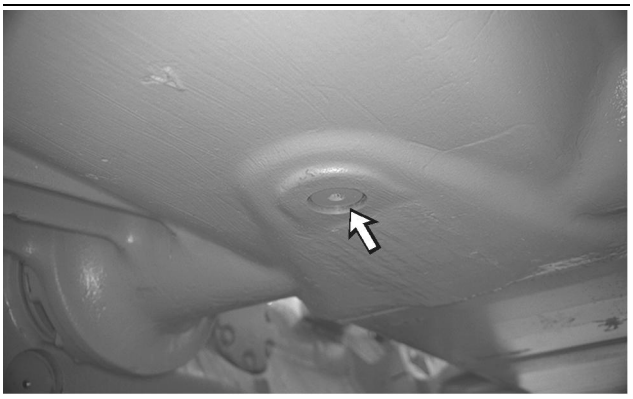


Illustration 302 g00484767

1. Remove the plug from the drain in the bevel gear case. Install a 4C-8563 Swivel into the valve. Clamp a hose to the swivel. A 25.4 mm (1 inch) pipe and hose can be used. Use a 25.4 mm (1 inch) pipe with 1-11 1/2 NPTF threads. Do not tighten the pipe.

2. Turn the swivel or pipe clockwise in order to open the internal drain valve. Allow the oil to drain into a suitable container.

3. Remove the rear bottom guard.

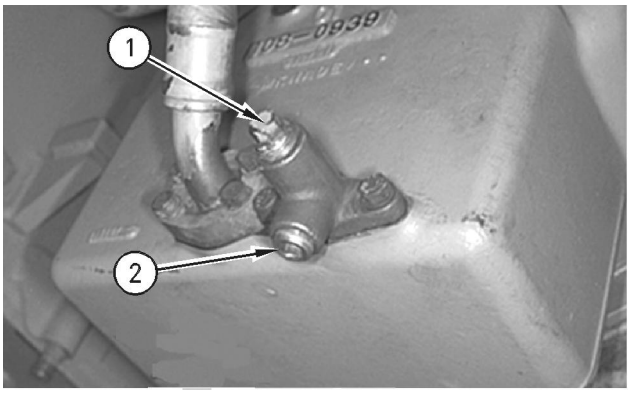


Illustration 303 g00484821

4. Remove plug (2) from the drain valve in the torque converter. Install a 12.7 mm (.5 inch) pipe into the drain valve. Use a 12.7 mm (0.50 inch) pipe with 1/2-14 NPTF threads.

5. Clamp a hose to the pipe in order to drain the oil into a suitable container.

6. Open drain valve (1) and drain the oil into a suitable container.

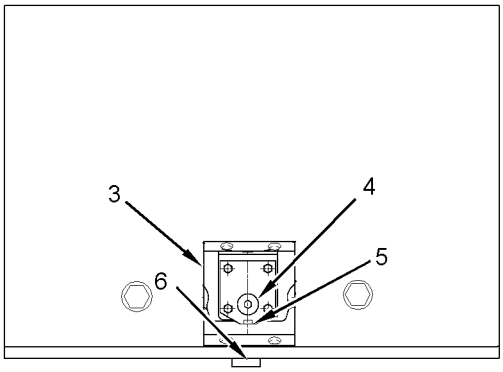


Illustration 304 g01023184

7. Remove the access cover (3) to the drain for the transmission (not shown). Remove plug (6) in the guard for access to the drain valve.

8. Remove plug (5) from the drain valve in the transmission. Install a 12.7 mm (.5 inch) pipe into the transmission valve. Use a 12.7 mm (0.50 inch) pipe with 1/2-14 NPTF threads. Clamp a hose to the pipe in order to drain the oil into a suitable container.

9. Open drain valve (4) and drain the oil into a suitable container.

10. Change the filter element. See the Topic “Transmission System Oil Filter-Replace” in this manual.

11. Close the drain valve in the torque converter. Close the drain valve in the transmission case.

12. Remove the hoses and remove the pipes from the drains.

13. Remove the swivel or remove the pipe from the drain in the bevel gear case. The drain valve will close.

14. Clean the oil drain plugs and install the oil drain plugs.

Clean Screens

Screens should be removed and cleaned when the oil is drained. Drain the oil into a suitable container before removing any screen.

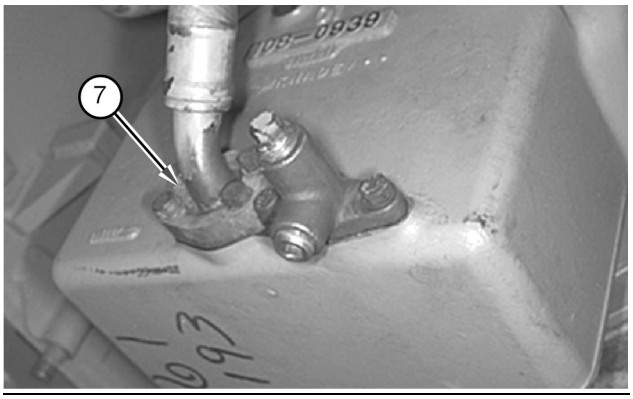


Illustration 305 g01124858

1. Remove torque converter scavenge line (7). Remove the screen.

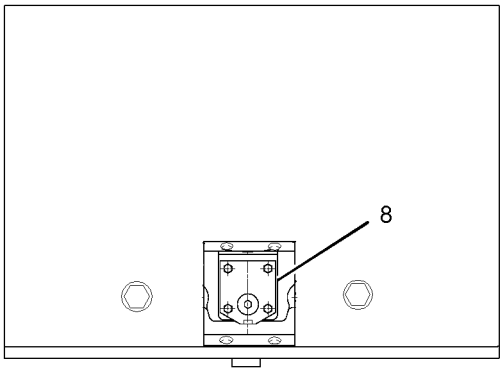


Illustration 306 g01356854

2. Remove cover (8) from the transmission scavenge screen. Remove the screen.

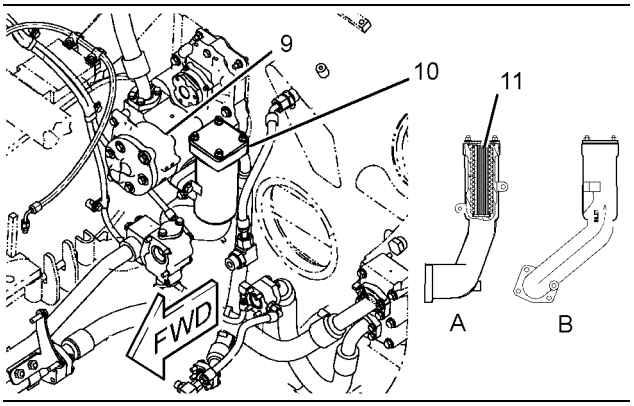


Illustration 307 g01356715

(A) Right side view
(B) Front view

3. Remove cover (10), the seal, and four bolts from the main suction line that is next to the power train oil pump (9). Remove main suction screen (11) .

4. Inspect the O-ring seal. If the seal is damaged, replace the seal.

5. Clean the three screens in clean, nonflammable solvent.

6. Install the screens. Install the covers.

Fill With Oil

1. Open the access door for the filler cap. The filler cap is located on the right side of the machine next to the hydraulic oil tank.

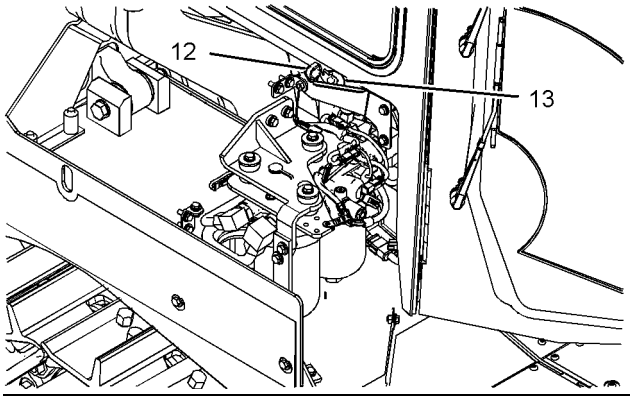


Illustration 308 g01351984

Some components are removed for clarity.

2. Remove oil fill cap (13).

3. Fill the bevel gear case with oil. See Operation and Maintenance Manual, “ Capacities (Refill)”.

4. Always measure the oil with the dipstick (12).

5. Maintain the oil level within the “OPR ZONE 16L” marks on the dipstick. The engine should be running at low idle. The power train should be at operating temperature. See Operation and Maintenance Manual, “Transmission System Oil Level - Check” for more information.

6. Clean oil filler cap (5). Install the oil filler cap.

7. Install the rear bottom guard.

For additional information about transmission system oil, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i03644991

Power Train System Oil Level - Check

SMCS Code: 3030-535-FLV

WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

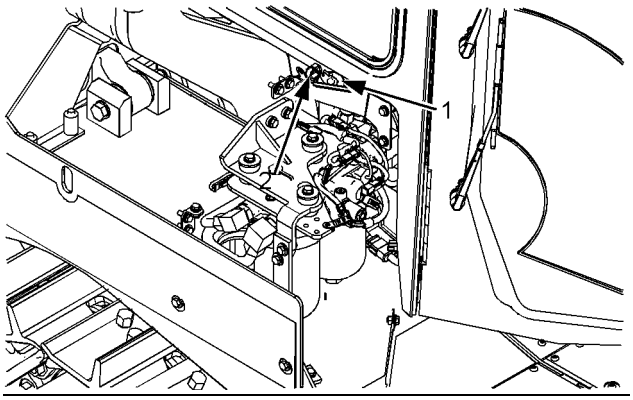


Illustration 309 g01019160

Some components are removed for clarity.

The transmission oil dipstick is behind the access door on the right side of the operator's station.

Open the access door and check the transmission oil level.

Hot Oil

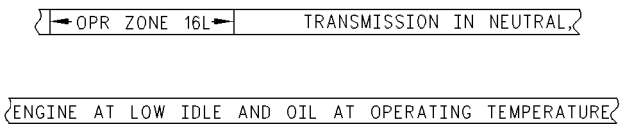


Illustration 310 g00493905

Use the “TRANSMISSION IN NEUTRAL, ENGINE AT LOW IDLE, AND OIL AT OPERATING TEMPERATURE” side of the dipstick (2). Check when the transmission is in NEUTRAL and the engine is running at LOW IDLE. The oil should be at operating temperature. Maintain the oil level between the “OPERATING ZONE” marks. This is the only accurate way to check the oil level.

Cold Oil

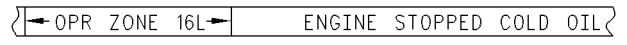


Illustration 311 g00493912

Check the “ENGINE STOPPED COLD OIL” side of dipstick (2) while the engine is stopped. Maintain the oil between the “OPERATING ZONE” marks. This method should be used as reference only.

Note: When you are operating the machine on severe slopes, the quantity of oil in the transmission can be increased up to 10 percent. When you are operating with the increased oil quantity, prolonged operation in some machines can cause high transmission oil temperatures. After the work on the severe slopes has been completed, drain the excessive oil quantity from the bevel gear case.

1. If the oil level on dipstick (2) indicates that oil is needed, remove filler cap (1) and add the oil.
2. Clean the filler cap and install the filler cap.
3. Close the access door.

i03644992

Power Train System Oil Sample - Obtain

SMCS Code: 3080-008

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the transmission oil as close as possible to the recommended sampling interval. The recommended sampling interval is every 500 service hours. In order to receive the full effect of S·O·S oil analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent oil samplings that are evenly spaced.

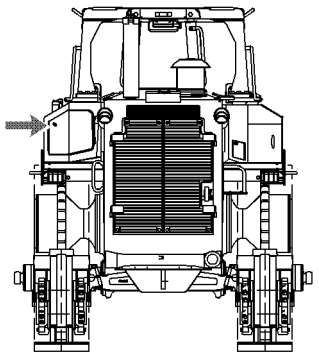


Illustration 312 g01019134

1. Open the access door on the right side of the cab.

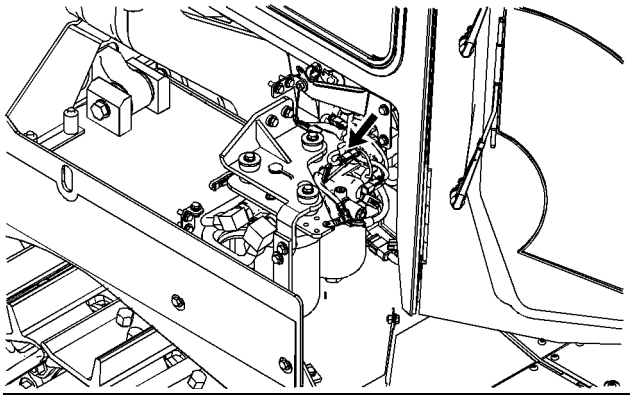


Illustration 313 g01018659

(Some components are removed for clarity.)

2. Remove the protective cap from the sampling port.

3. Obtain a sample of transmission oil. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the transmission oil.

4. After you take a sample, remove the cap with the tube and the probe from the bottle. Discard the cap with the tube and the probe. Install the sealing cap that is provided with 169-8373 Fluid Sampling Bottle.

5. Replace the protective cap.

6. Close the access door and secure the door.

For additional information about transmission system oil, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01107744

Radiator Guard Pin Joint - Inspect

SMCS Code: 7155-040

1. Park on a level surface.

2. Raise the bulldozer blade.

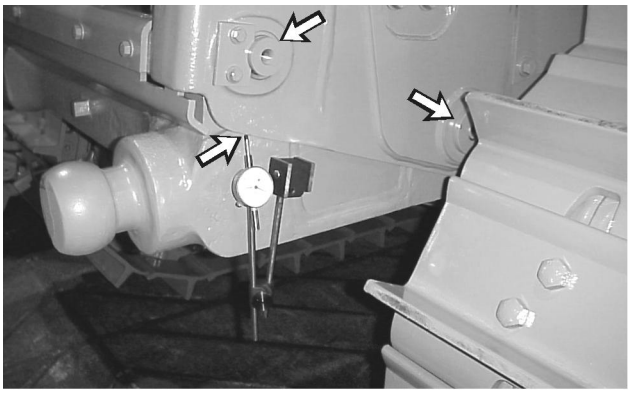


Illustration 314 g00584863

3. Install the magnetic base of a dial indicator on the main frame of the machine. Place the tip of the indicator on the bottom edge of the radiator guard directly beneath one of the pins.

4. Lower the bulldozer blade. Apply sufficient down pressure in order to raise the front of the machine off the ground.

5. If the travel of the indicator is more than 1 mm (0.04 inch), replace the pin and replace the bushing.

6. Check the other three pin locations. Contact your Caterpillar dealer for service.

i03499636

Radiator Pressure Cap - Clean/Replace

SMCS Code: 1353-070-Z2; 1353-510-Z2

WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

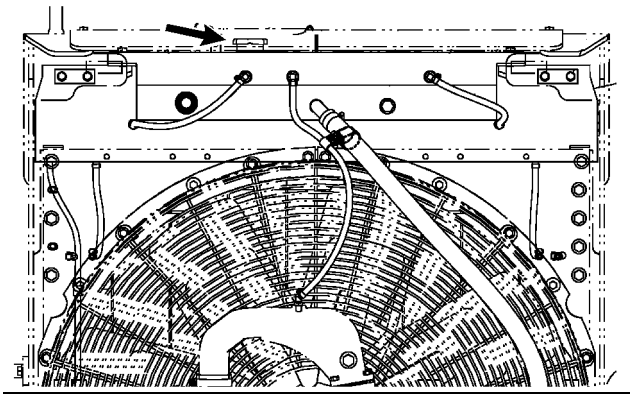


Illustration 315 g01835526

Rear view

1. Open the access cover to the radiator cap on top of the radiator guard. Unlock the cover, if necessary.
2. Slowly remove the radiator cap in order to relieve system pressure.
3. Inspect the radiator cap for damage, for deposits, or for foreign material. Clean the radiator cap with a clean cloth. Replace the radiator cap if the radiator cap is damaged.
4. Install the radiator cap.

i01960703

Recoil Spring Compartment Oil Level - Check

SMCS Code: 4158-535

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

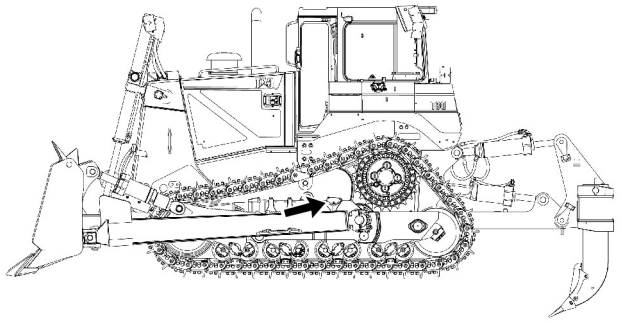


Illustration 316 g01018614

1. Remove all of the debris around the cover plate on the top of the track roller frame.
2. Remove the cover plate for the oil filler. Observe the level of the oil.

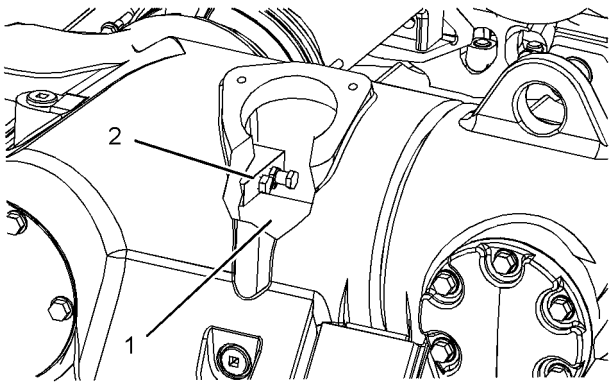


Illustration 317 g01110810

3. Maintain the oil level above the top of the track adjusting cylinder (1). Do not fill the oil above the track adjustment valve (2).
4. Install the cover plate.
5. Repeat the procedure for the other recoil compartment.

i03649694

Refrigerant Dryer - Replace

SMCS Code: 7322-510; 7322-535

⚠ WARNING

Personal injury can result from contact with refrigerant.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use precaution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well ventilated area.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Use a certified recovery and recycling cart to properly remove the refrigerant from the air conditioning system.

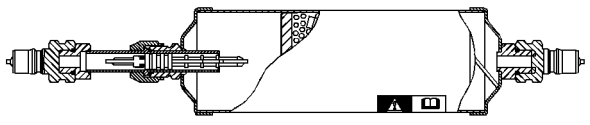


Illustration 318 g01017640

Note: The “R-134a” refrigerant dryer receiver should be replaced annually. Extremely humid operating conditions may require more frequent replacement of the dryer. The dryer should also be replaced if the air conditioning system has been leaking or if the system has been opened for service repair.

The in-line dryer is accessible by removing the floor panel in the cab.

Reference: For the correct procedure, refer to Air Conditioning and Heating Service Manual, SENR5664 or the Disassembly and Assembly Manual for your machine.

Note: A qualified mechanic should replace the components of the refrigerant system since special tooling and training are required.

i01286780

Ripper Linkage and Cylinder Bearings - Lubricate

SMCS Code: 6313-086-BD, L4

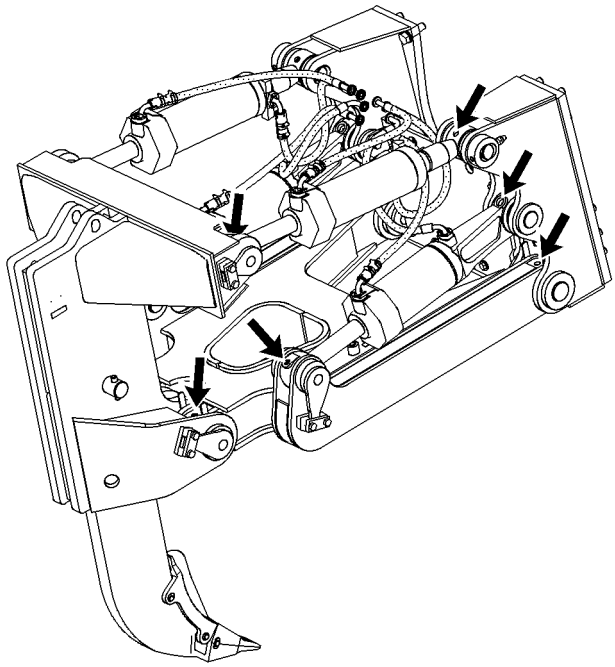


Illustration 319 g00681900

Lubricate twelve grease fittings (six per side). Use MPGM Grease.

i00925689

Ripper Tip and Shank Protector - Inspect/Replace

SMCS Code: 6808-040; 6808-510; 6810; 6812-040; 6812-510

If equipped:

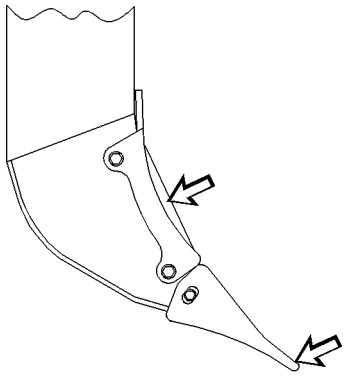


Illustration 320 g00550432

When the ripper tip is worn close to the shank, replace the ripper tip. When the shank protector is worn close to the shank, replace the shank protector. If the tip is too blunt, the tip will not penetrate properly.

1. Raise the ripper. Place blocking under the ripper. Lower the ripper onto the blocking. The ripper should be high enough so that the ripper tip or the shank protector can be removed. Do not place the ripper too high.
2. If the ripper tip is worn, drive out the pin. Remove the tip and the shank pin retainer.
3. Clean the shank pin retainer and the pin.
4. Install the new tip and the retainer.
5. Install the pin from the opposite side of the retainer.
6. If the shank protector is worn, drive out the pins. Remove the shank protector.
7. Clean the pin retainers and the pins.
8. Install the new shank protector and the retainers.
9. Install the pins from the opposite side of the retainer.
10. Raise the ripper and remove the blocking.
11. Lower the ripper to the ground.

i01961853

Rollover Protective Structure (ROPS) - Inspect

SMCS Code: 7325-040

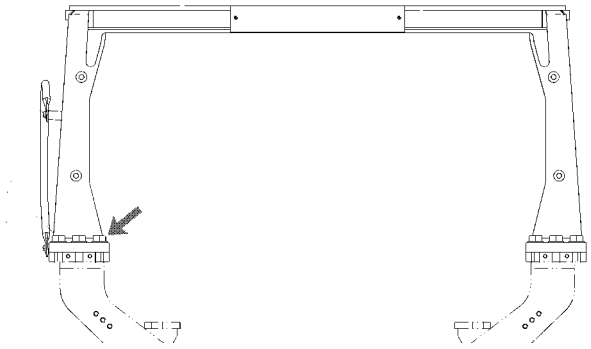


Illustration 321 g01019290
Front view

Inspect both sides of the Rollover Protective Structure (ROPS) for bolts that are loose or damaged. Replace any damaged bolts and any missing bolts with original replacement parts only. Tighten the ROPS bolts to a torque of 1400 ± 200 N·m (1030 ± 150 lb ft).

Note: Apply oil to all bolt threads for the ROPS before you install the ROPS bolts.

Do not weld reinforcement plates to the ROPS in order to straighten the ROPS. Do not weld reinforcement plates to the ROPS in order to repair the ROPS.

If the ROPS has any cracks in the welds, in the castings, or in any metal section, consult your Caterpillar dealer for repairs.

i02429589

Seat Belt - Inspect

SMCS Code: 7327-040; 7520

Always check the condition of the seat belt and the condition of the seat belt mounting hardware before you operate the machine. Replace any parts that are damaged or worn before you operate the machine.

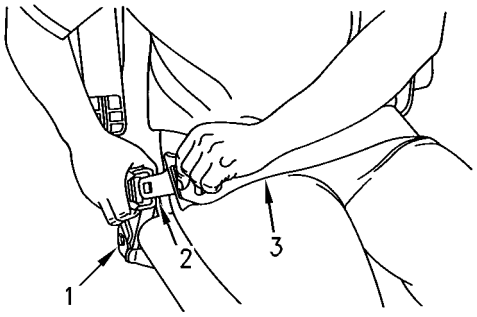


Illustration 322 g00932801

Typical example

Check the seat belt mounting hardware (1) for wear or for damage. Replace any mounting hardware that is worn or damaged. Make sure that the mounting bolts are tight.

Check buckle (2) for wear or for damage. If the buckle is worn or damaged, replace the seat belt.

Inspect the seat belt (3) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

Note: Within three years of the date of installation or within five years of the date of manufacture, replace the seat belt. Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

If your machine is equipped with a seat belt extension, also perform this inspection procedure for the seat belt extension.

i02429594

Seat Belt - Replace

SMCS Code: 7327-510

Within three years of the date of installation or within five years of the date of manufacture, replace the seat belt . Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

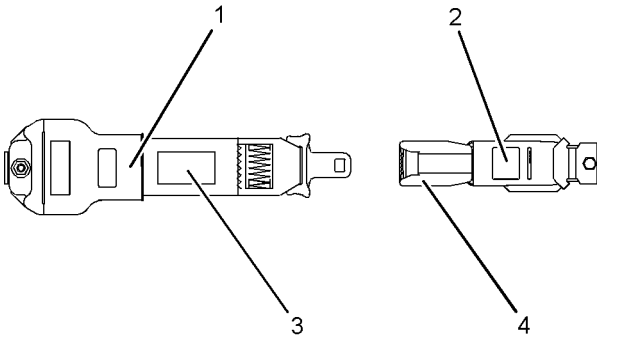


Illustration 323 g01152685

(1) Date of installation (retractor)
(2) Date of installation (buckle)
(3) Date of manufacture (tag) (fully extended web)
(4) Date of manufacture (underside) (buckle)

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

If your machine is equipped with a seat belt extension, also perform this replacement procedure for the seat belt extension.

i02773461

Steering Charge Filter - Replace

SMCS Code: 431F

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

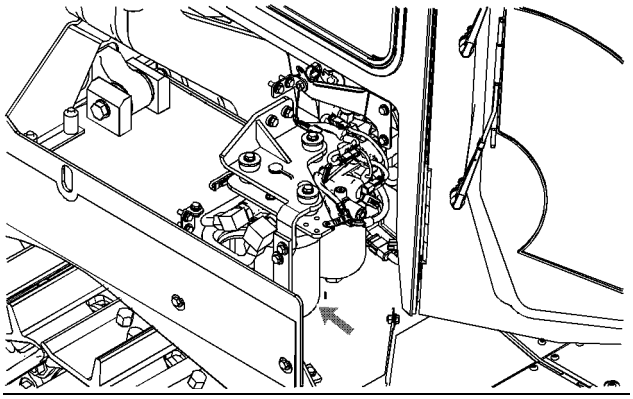


Illustration 324 g01103238

1. Open the access door on the right side of the cab.
2. Remove the steering charge filter. Discard the used filter element properly. Make sure that all of the old filter seal is removed from the filter base.
3. Clean the filter base with a clean cloth.
4. Install the new filter element by hand.

   Instructions for the installation of the filters are printed on the side of each Caterpillar spin-on filter. For non-Caterpillar filters, refer to the installation instructions that are provided by the supplier of the filter.

i02777193

Torque Converter Scavenge Screen - Clean

SMCS Code: 3101-070-MGS; 3105

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

When you change the transmission oil, clean the torque converter scavenge screen.

1. Remove the bottom guard in order to gain access to the torque converter.

Note: Drain all fluids into a suitable container.

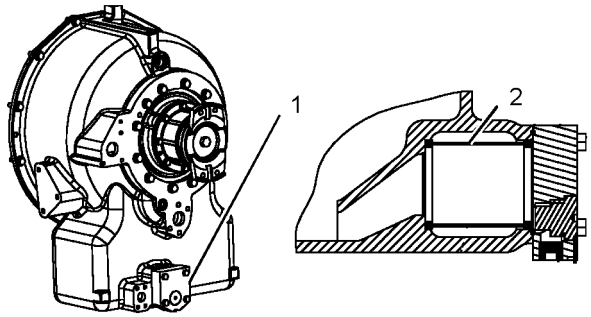


Illustration 325 g01387611

2. Remove the bolts and drain valve body (1) from the torque converter, as shown.
3. Remove torque converter scavenge screen (2) from the torque converter housing.
4. Wash the screen in a clean, nonflammable solvent.
5. Install torque converter scavenge screen (2) in the torque converter housing. Install the bolts and drain valve body (1).
6. Install the bottom guard.

Reference: See Operation and Maintenance Manual, “Transmission System Oil and Screens - Change/Clean” in order to fill with oil.

i02877237

Track - Check/Adjust

SMCS Code: 4170-036

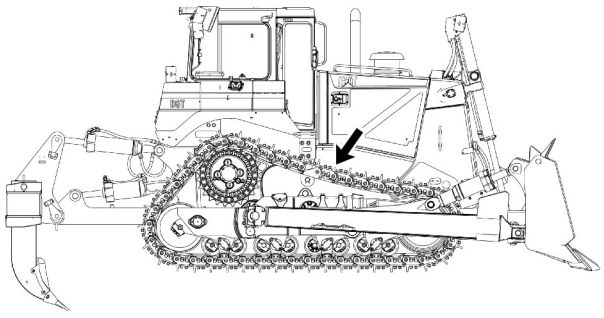


Illustration 326 g01015715

Check the track adjustment. Check the track for wear and for excessive dirt buildup.

⚠ WARNING

Grease is under high pressure.

Grease coming out of the relief valve under pressure can penetrate the body causing injury or death.

Do not watch the relief valve to see if grease is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

Loosen the relief valve only one turn.

1. Move the machine forward. Allow the machine to coast to a stop without the use of the service brakes. Adjust the tracks while you are in the machine's typical operating conditions. If packing conditions prevail on the workplace, the tracks should be adjusted without removing the packed material.

2. To measure the sag in the track, stretch a string over the grousers that are between the sprocket and the front idler. Take the measurement from the string to the top of the grouser at the maximum measurement. Dimension (A) is the maximum distance between the string and the grouser.

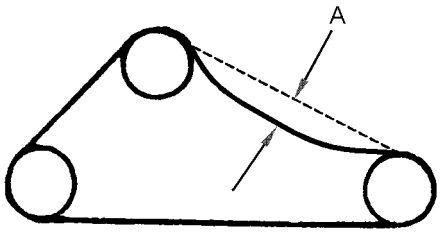


Illustration 327 g01109482

If a machine does not have carrier rollers, the sag in the track is measured between the sprocket and the front idler. The correct adjustment of dimension (A) for conventional undercarriage is 115 ± 10 mm (4.5 ± .4 inch).

See the following tables for information on the SystemOne Undercarriage, if equipped.

Table 23

Track Sag			
No Carrier Roller	**Minimum**	**Target**	**Maximum**
Conventional	105 mm (4.1 inch)	115 mm (4.5 inch)	125 mm (4.9 inch)
SystemOne(1)	80 mm (3.15 inch)	110 mm (4.30 inch)	120 mm (4.72 inch)

(1) Machines with the SystemOne undercarriage have tighter dimensions for track sag.

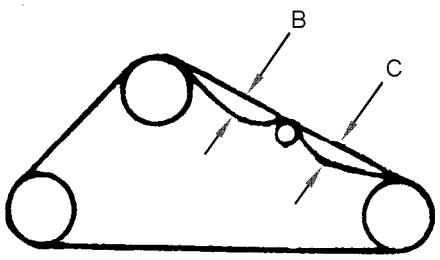


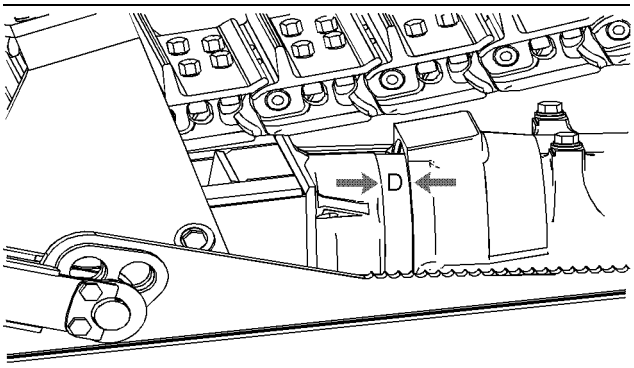
Illustration 328 g01118207

If the machine is equipped with a carrier roller, calculate the average of dimension (B) and dimension (C). The correct average value is 65 ± 10 mm (2.6 ± 0.4 inch) for the conventional undercarriage.

Table 24

Track Sag			
Carrier Roller	**Minimum**	**Target**	**Maximum**
Conventional	55 mm (2.2 inch)	65 mm (2.6 inch)	75 mm (3.0 inch)
SystemOne(1)	45 mm (1.80 inch)	60 mm (2.40 inch)	70 mm (2.8 inch)

Loose Track Adjustment

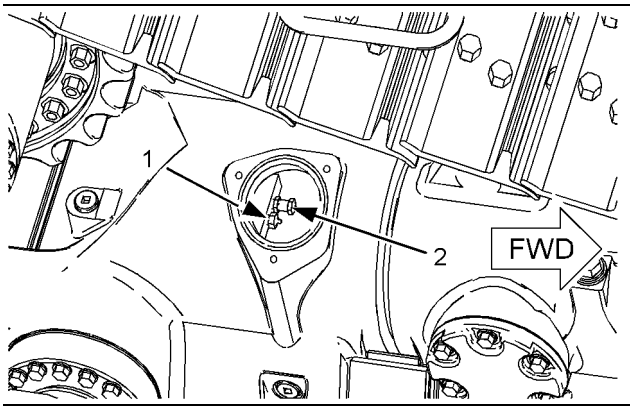


g01019107

Illustration 329

NOTICE
Do not attempt to tighten track when dimension (D) is 152 mm (6.0 inch) or more. The hard bottom attachment can be tightened to the point were (D) is no more than 152 mm (6.0 inch)Contact your Caterpillar dealer for track service or instructions.

1. Remove the access cover.



g01019116

Illustration 330

2. Add multipurpose grease (MPGM) through track adjustment valve (1). Add the MPGM until dimension (A, B, C) is correct.

3. Operate the machine back and forth in order to equalize the pressure. Allow the machine to coast to a complete stop. Do not use the brakes.

4. Remeasure dimension (D).

Tight Track Adjustment

1. Loosen relief valve (2) by one turn of 360 degrees. Allow the grease to escape.

2. Close the relief valve.

3. Add MPGM through track adjustment valve (1). Add grease until dimension (A, B, C) is correct.

4. Install the access cover.

Bolt Torque for Track Shoes

The torque requirement for track shoe bolts is 650 ± 70 N·m (480 ± 50 lb ft). Tighten the bolts for an additional 120 degrees. If you are using bolts with a master link, tighten the bolts to a torque of 650 ± 70 N·m (480 ± 50 lb ft). Then, tighten the bolts for an additional 120 degrees.

i01967541

Track Pins - Inspect

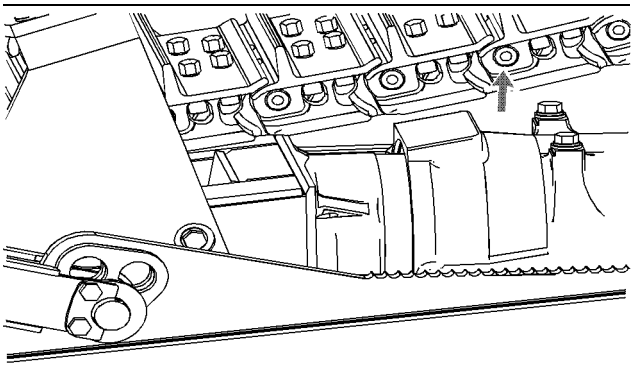
SMCS Code: 4175-040-PN

⚠ WARNING

Fingers can be burned from hot pins and bushings.

The pins and bushings in a dry joint can become very hot. It is possible to burn the fingers if there is more than brief contact with these components.

Use the recommendations in order to extend the life of the undercarriage. Use the recommendations in order to avoid excessive downtime.



g01021628

Illustration 331

1. During the machine operation, listen for unusual squeaking and for unusual squealing. This can indicate a dry joint.

2. Check the machine for dry joints weekly. Check for dry joints immediately after machine operation. After machine operation, lightly touch the end of each track pin or bushing. Touch the track pin or the track bushing with the back of your hand. Make a mark on any dry track pin joint that is very hot to the touch.

3. Do not hit the ends of the track pins with a sledge hammer in order to loosen the track joints.

NOTICE
Striking the end of a track pin introduces a significant amount of end play into the track joint and can result in early failures.

Consult your Caterpillar dealer's Custom Track Service expert if you detect dry joints or leaks. Your Caterpillar dealer's Custom Track Service expert can perform track inspection.

i02039992

Track Roller Frame - Inspect

SMCS Code: 4151-040

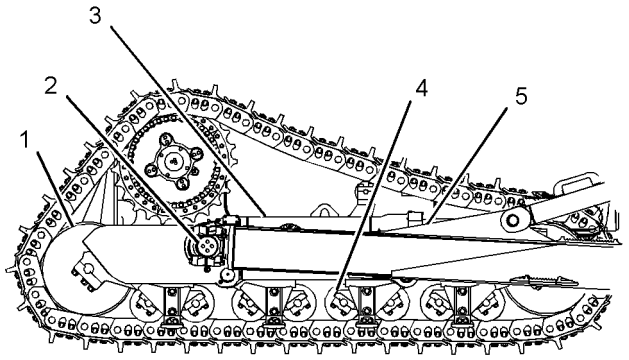


Illustration 332 g01049034

Inspect the track roller frame (3) for leaks. Check the seal for the pivot shaft (2) for oil leaks. Check the idlers (1) and track rollers (4) for leaks. Inspect the seal for the recoil spring (5) for oil leaks.

i01967485

Track Roller Frame Guides - Inspect

SMCS Code: 4177-040

Measure the rotational movement of the front roller frame relative to the rear roller frame.

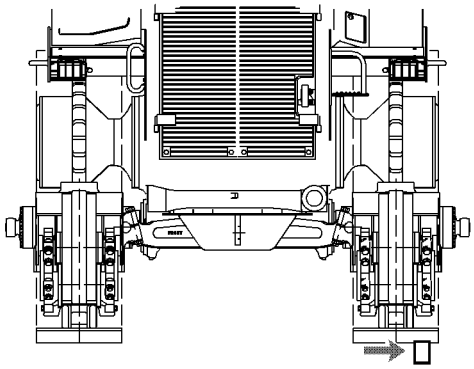


Illustration 333 g01021588

Some components are removed for clarity.

1. Raise the front of the machine with the hydraulics of the dozer. Place a 100 mm (4 inch) block under the outside edge of a track grouser. Place the block near the track idler. Lower the machine onto the block.

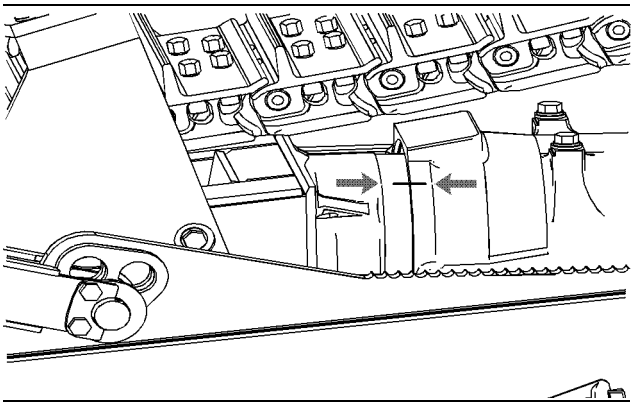


Illustration 334 g01021579

2. Use a grease pencil to make a mark on the tubular section of the front roller frame. Make a mark on the rear of the roller frame. This mark should correspond with the mark that is on the tubular section.

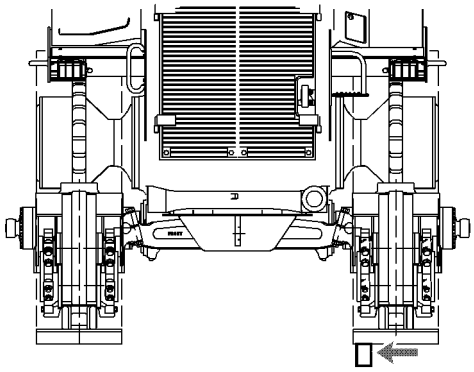


Illustration 335 g01021605

Some components are removed for clarity.

3. Raise the front of the machine with the hydraulics of the dozer. Place the block under the inside edge of the same track grouser. Lower the machine onto the block.

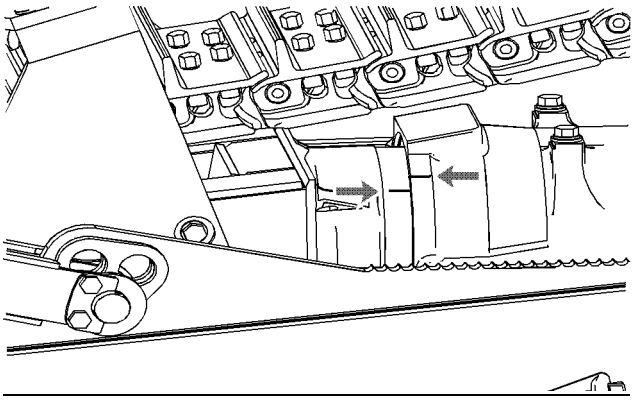


Illustration 336 g01021583

4. Put a mark on the tubular section of the front roller frame. This mark should correspond with the mark on the rear roller frame. Measure the distance between the two marks on the front roller frame.

If the distance between the two marks is greater than 4.5 mm (.18 inch), inspect the track roller frame guides for wear.

Repeat the entire procedure for the other side of the machine.

NOTICE
Never build up the track roller frame guides with hard-face welding. This will cause serious wear damage to the guide slots in the front track roller frame.

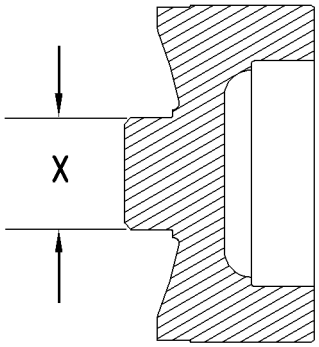


Illustration 337 g00785460

If dimension (X) is less than 45.3 mm (1.78 inch), replace the track roller frame guides. Consult your Caterpillar dealer for information or for service.

i03409088

Walk-Around Inspection

SMCS Code: 1000; 7000

Reference: See Operation and Maintenance Manual, “Daily Inspection” for more information.

i02112864

Winch Fairlead Rollers - Lubricate

SMCS Code: 5163-086

If equipped:

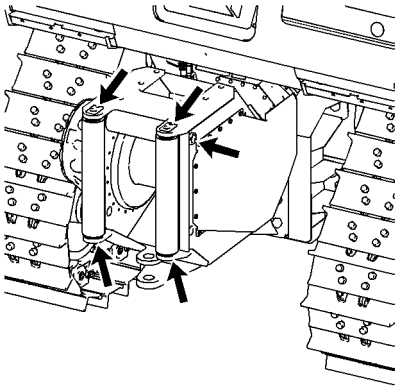


Illustration 338 g01076211

Lubricate the five fittings. Use MPGM Grease.

i02112874

Winch Oil Level - Check

SMCS Code: 5163-535-FLV

If equipped:

PA140VS

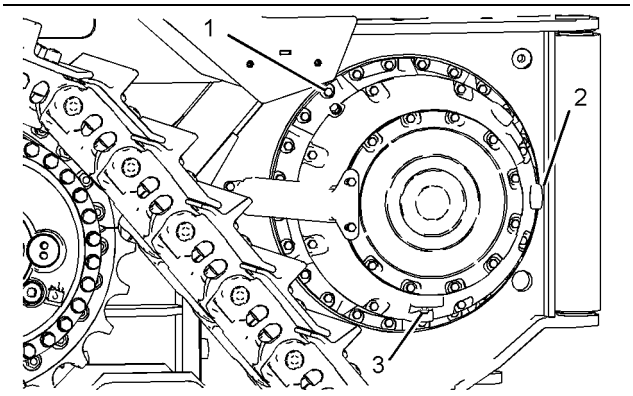


Illustration 339 g01076215

1. Remove oil level plug (2) in order to check the oil level. The oil level should be maintained to the bottom of the level plug hole.
2. If necessary, remove oil filler plug (1) and add oil.

   Check for oil leaks around the covers and around the hoses. Repair any oil leaks.

i02773475

Winch Oil and Breather - Change/Clean

SMCS Code: 5163-044

If equipped:

WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

PA140VS

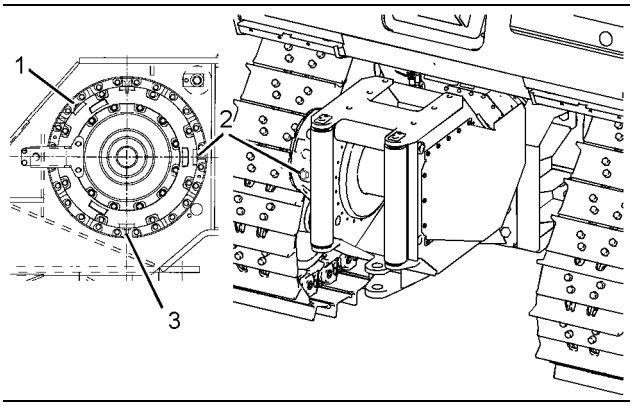


Illustration 340 g01076796

1. Remove oil filler plug (1).
2. Remove drain plug (3) on the bottom of the winch. Allow the oil to drain into a suitable container.
3. Inspect the plug seal. If necessary, replace the plug seal.
4. Clean drain plug (3) and install the drain plug.
5. Remove oil level plug (2).
6. Fill the oil compartment until oil is visible at the bottom of the opening for oil level plug (2). See Operation and Maintenance Manual, “Capacities (Refill)”.
7. Clean the vent plug that is in filler plug (1). Use a clean nonflammable solvent.
8. Install oil filler plug (1).
9. Run the engine at low idle. Maintain the oil level so that the oil level is visible at the bottom of the opening for oil level plug (2).
10. Install the oil level plug.

i02094238

Winch Wire Rope - Install (If Equipped)

SMCS Code: 5163-012

⚠ WARNING

Personal injury or death can result from worn wire rope cable.

Worn or frayed cable could break causing injury.

Check the wire rope cable. If cable is worn or is frayed install a new cable.

PA140VS

The cable is attached to the drum on the winch with a cable ferrule. The ferrule is placed into a socket on the drum.

Use the following table to order the cable.

Table 25

Wire Cable		
Wire Rope Diameter	Recommended Ferrule	Holding Capacity
25 mm (1 inch)	L-8	91 m (300 ft)
29 mm (1.13 inch)	J-9	84 m (276 ft)
32 mm (1.25 inch)	J-10	59 m (193 ft)

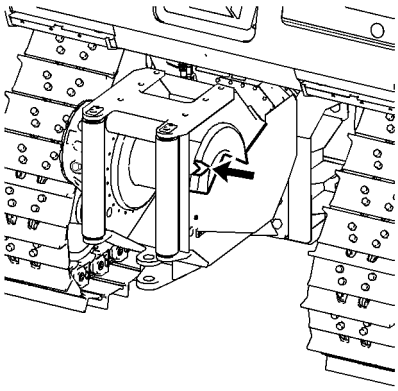


Illustration 341 g01076208

1. Put the cable in a straight line behind the tractor.
2. Install the ferrule end into the socket.
3. Reel in the cable.

i01961420

Window Washer Reservoir - Fill (If Equipped)

SMCS Code: 7306-544

NOTICE
When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

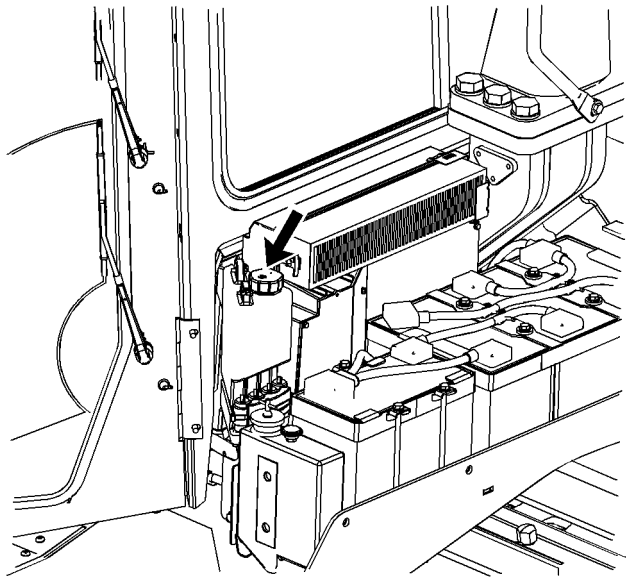


Illustration 342 g01018997

Windshield Washer – The washer fluid bottle is on the left side of the cab on the front post, as shown. Open the access cover. Remove the fluid bottle cap in order to fill the washer fluid bottle.

i02770681

Window Wipers - Inspect/Replace (If Equipped)

SMCS Code: 7305-040; 7305-510

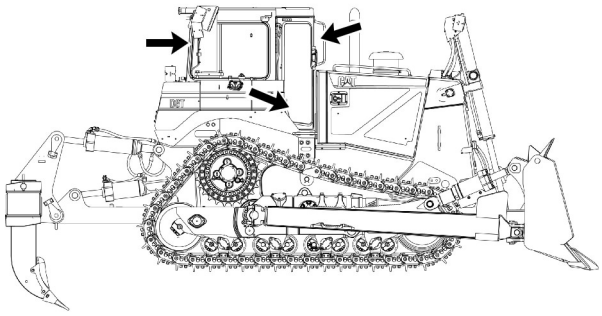


Illustration 343 g01018994

Inspect the front windshield wiper blade, the right windshield wiper blade, the left windshield wiper blade, and the rear windshield wiper blade. Replace any wiper blades that are damaged or worn. Replace any wiper blades that streak the windshield.

i01083628

Windows - Clean

SMCS Code: 7310-070; 7340-070

If equipped:

Use commercially available window cleaning solutions to clean the windows.

To clean the outside of the rear window from the inside of the cab, remove the sliding section of the rear window. Use the following procedure in order to remove the sliding section of the rear window.

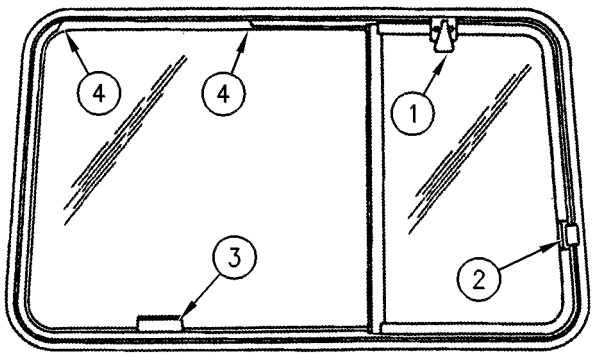


Illustration 344 g00039956

1. Lift latch (1) in order to slide the small window. Squeeze latch (2) in order to move the window from the CLOSED position.
2. Move handle stop (3) to the UP position. To move the handle stop to the UP position, lift the handle and rotate the handle simultaneously. Rotate the handle until the handle is vertical.
3. Move the small section of the window to opening (4) in the upper window channel.
4. Tilt the top of the window toward the inside of the cab. Remove the window.
5. Stay inside the cab in order to clean the outside of the rear window.
6. After cleaning, install the sliding section of the rear window.